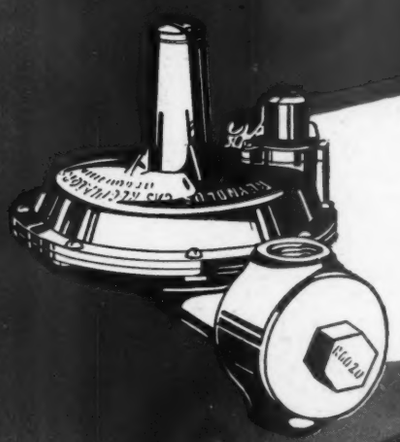
AMERICAN GAS JOURNAL

88th YEAR | MAY 1946 | VOL. 164 NO. 5

Efficient Gas Control by—

REYNOLDS

Efficient Gas Controls by Reynolds are real proven products, not a dream of next year. Regardless of whether it is a job for a single regulator, or a more complicated combination of controls, Reynolds controls will give you the ultimate in gas control.



For more than half a century, Reynolds has concentrated exclusively on Gas Control devices. Accurate Gas Control, by Reynolds, from one ton down to inches, W. C., has been an accomplished fact for many decades.

Reynolds Engineers and Executives will gladly work with you on your Gas Control Problems. Write.

GAS CONTROL *Since* 1892

REYNOLDS GAS REGULATOR CO. ANDERSON, INDIANA U. S. A.

For TURTLE-BACK PROTECTION

Specify

THE DRESSER BELLMASTER JOINT

It's easy to handle

COMES AS ONE PART

STOCKED AS ONE PART

ASSEMBLED AS ONE PART

A FACTORY-MADE PIPE JOINT

Once you bury it, you can forget it. The Bellmaster joint is protected against corrosion by the bell itself.

It's fast and easy to install, too. Just insert the Bellmaster joint in the bell, turn, stab pipe home, and tighten bolts. Any workman can install it with a simple wrench. It takes as little as two minutes (depending on the diameter), in any weather, in wet or dry ditch. It's easy to handle . . . you receive it as one part . . . stock it as one part . . . assemble it as one part.

The Bellmaster joint stays tight permanently. The resilient gasket seal gives it flexibility to absorb stresses due to temperature variations, earth movements and traffic shock.

Write your favorite foundry for information about Bellmaster pipe . . . write Dresser for information about Bellmaster joint.

DRESSER MANUFACTURING DIVISION
155 Fisher Avenue, Bradford, Pennsylvania
In Texas: 1121 Rothwell St., Sec. 16, Houston, Texas.
In Canada: Dresser Manufacturing Co., Ltd.,
60 Front Street, West, Toronto, Ontario.

DRESSER BELLMASTER JOINT

ONE OF THE DRESSER INDUSTRIES

THERE ARE MANY TYPES OF REVERSING VALVES USED WITH THE BACKRUN PROCESS—BUT

44.9% of the BACKRUN installations now in use in water gas plants are equipped with the

SEMET-SOLVAY 3-WAY BACKRUN VALVE

Consider These Features

1. Designed for heavy oil operation with spray system to reduce carbon and tar accumulations.
2. Large quick-opening door for easy inspection, cleaning and repairs.
3. Uniform pressure against lute on all sides.
4. Dished welded steel discs to prevent warping, easily removed disc seats.
5. Cushioned seating prevents slamming.
6. Two large bearings cooled by radiation.
7. Tightly fitted bearings eliminate stuffing box leakage.
8. Made to fit your machine and shipped assembled, ready to install quickly.

Your inquiries will receive prompt attention

U. S. PATENTS
NO. 1761600
NO. 1854531
NO. 1900958
NO. 1900959
NO. 1900961

SEMET-SOLVAY ENGINEERING CORPORATION
Engineering Contractors
40 RECTOR ST. NEW YORK, N. Y.

AMERICAN GAS JOURNAL, May, 1946. Vol. 164, No. 5. Published monthly by American Gas Journal, Inc., at 34 North Crystal St., East Stroudsburg, Pa., Executive and Editorial offices at 53 Park Place, New York 7, N. Y. Entered as second-class matter, October 7, 1928, at the post office at East Stroudsburg, Pa., under the Act of March 3, 1879. Printed in U. S. A.

Higher and Higher

GO STANDARDS

"The Blue Flame *is* on the March!". The gas industry is alert to its competitive opportunities.

Modernization for more efficient utilization of the qualities of gas as a fuel will build desirable loads and a growing industry.

"New Freedom Kitchen" promotion through national advertising, showroom displays, and other activities, is creating consumer demand for these higher standards of convenience and beauty in the home. Appliances lead the way for the benefit of all other gas equipment and accessory manufacturers.

We *all* therefore have a responsibility in this program for raising the standards of merchandising, equipment and service; in the common interest of the *whole* industry.

Quality ranges, built to CP standards, lead the way.

AMERICAN METER COMPANY

INCORPORATED (ESTABLISHED 1836)

Albany · Baltimore · Birmingham · Boston · Chicago · Dallas · Erie · Houston · Kansas City · Los Angeles · New York · Philadelphia · Pittsburgh · San Francisco · Tulsa

AGAIN WE QUOTE

(Excerpt from a statement by the Chief of Bureau of Gas and Water Distribution in a Virginia city)

"It became necessary to reinforce the gas system on the south side of the river by installing a high pressure gas main across a bridge. We decided to use mechanical joint cast iron pipe, with hangers on the side of the bridge for support, as shown in the picture. There are two sections to the bridge with an island in between, the two sections are in lengths of five hundred and eight hundred feet and the island is three hundred feet long. After the hangers were in place we laid the 1600 feet of pipe across both sections of the bridge in two and one-half days."

(Editor's Note: Fast work, even with time-saving mechanical joint pipe, considering that the scaffolding had to be kept moving, too.)

Cast Iron Pipe Research Association,
Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago 3.

CAST IRON
Standardized MECHANICAL JOINT
PIPE

THE COLUMBIA SYSTEM in 1945

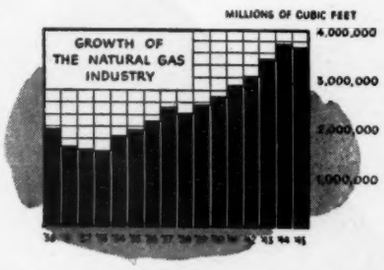
From The Annual Report of Columbia Gas & Electric Corporation

During 1945, the Columbia System passed from concentration on providing fuel for the furnaces of war to operations involved in the economy of peace. This changeover is being accomplished with little effect on public service operations or on the gross revenue of the System.

The Columbia System is comprised of Columbia Gas & Electric Corporation (The Parent Company) and 33 subsidiaries engaged in production, transmission and distribution of natural gas and electric energy. The System serves nearly 1,750,000 customers in 1,746 communities in Indiana, Kentucky, Maryland, New York, Ohio, Pennsylvania, Virginia and West Virginia.

Gas through 32,629 miles of field, transmission and distribution pipelines. Columbia served 1,278,213 customers with more than 179 billion cubic feet of gas. Industry depends heavily on this efficient fuel. Industrial customers, 3,179 of them, used more than 58 billion cubic feet in 1945. Columbia served 1,182,601 homes.

Electricity served to 447,139 customers, providing them with more than 2,628,000,000 kilowatt hours of electric energy over 16,529 miles of circuit lines. Industry, heavily dependent upon electric power, used more than 1,442,000,000 kwh, while 390,098 homes were supplied with nearly 444,000,000 kwh for light and power.



The use of natural gas, the favored fuel, has steadily increased. Last year, it is estimated that 3,700 billion cubic feet were produced by the entire natural gas industry. Reflecting this growth, Columbia System's gross revenues, 64% of which comes from gas sales, have risen from approximately 95 millions in 1936 to 138 millions in 1945.

Page 29

COLUMBIA GAS & ELECTRIC CORPORATION AND SUBSIDIARY COMPANIES

COMPARATIVE CONSOLIDATED INCOME STATEMENT

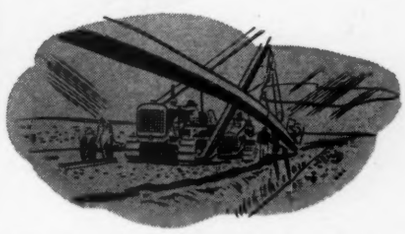
For the Year Ended December 31

SUBSIDIARY COMPANIES	1945	1944
Gross Revenues:		
Gas (Page 42)	$ 87,967,813	$ 84,915,604
Electric (Page 42)	41,760,253	42,754,527
Railway and Bus	.....	2,086,895
Oil and Gasoline	6,174,286	6,536,095
Water, Steam and Other Operations	1,791,957	1,536,754
Other Income (Interest, Dividends and Miscellaneous)	194,344	246,421
Total Gross Revenues	$137,888,653	$138,076,296
Operating Expenses:		
Operation—	$ 22,771,686	$ 18,100,744
Purchased Gas	14,054,478	14,241,316
Production of Gas, Electricity, Oil, Gasoline, etc.	4,150,425	4,416,719
Rents and Royalties	13,818,339	13,065,876
General and Administrative, Customers Accounting and Collecting	9,452,059	9,411,624
and Sales Promotion Expenses	$ 64,246,987	$ 59,236,279
Transmission, Distribution and Other Operating Expenses	7,251,320	7,304,529
Total Operation	13,078,903	15,549,271
Maintenance		
Provision for Depreciation and Depletion (Note 3)	9,898,160	10,224,935
Taxes (Note a)—	7,991,596	8,450,795
Other Than Federal Income and Excess Profits Taxes	6,896,958	12,070,606
Provision for Federal Income Tax	$109,363,924	$112,836,415
Provision for Federal Excess Profits Tax		
Total Operating Expenses	$ 28,524,729	$ 25,239,881
Gross Income Before Deducting Special Charge in 1945 (Note a)		
"Income Deductions Including Special Charge in 1945—	$ 2,481,274	$ .....
Special Charge (Note a)	3,107,712	3,112,049
Interest and Other Fixed Charges	101,834	71,120
Less—Interest Capitalized	2,220,011	2,450,012
Preferred Dividends	5,966	6,874
Earnings Applicable to Minority Interests	$ 7,713,129	$ 5,497,815
Total Income Deductions	$ 20,811,600	$ 19,742,066
Balance Applicable to Corporation		
COLUMBIA GAS & ELECTRIC CORPORATION	1,687,279	2,056,305
Administrative and Other Expenses and Taxes Less Miscellaneous Revenue	$ 19,124,321	$ 17,685,761
Balance Before Fixed Charges	3,656,619	3,976,036
Interest and Other Fixed Charges	$ 15,467,702	$ 13,709,725
Consolidated Net Income		
	$ 6,453,640	$ 6,453,640
Preferred Dividends Paid	$ 9,014,062	$ 7,256,085
Balance	74¢	59¢
Consolidated Earnings per Share of Common Stock Outstanding		

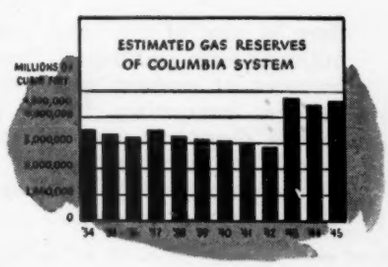
Note (a).

Federal taxes on income have been reduced resulting from the deduction for tax purposes of costs applicable to refinancing of bonds of subsidiary companies. An amount equivalent to this reduction is shown as a special charge in income deductions. The special charge and the reduction of taxes are both non-recurring items.

The attached notes are an integral part of the above statements.



Gas from the Southwest comes to the Columbia System through 2,400 miles of pipelines owned by others. This supply augments production from Columbia's 9,603 wells in the Appalachian area. In the last 10 years, to maintain the efficiency of Columbia's service, $176,600,000 has been spent on the construction and improvement of properties.



Gas reserves. The Columbia System last year withdrew only 4.6% of its estimated proven and unproven gas reserves. Available to the System from its own wells and from the vast Southwestern fields are reserves estimated at 4,500 billion cubic feet—assurance of service to the public for many years to come.

* * *

The information set forth here is not given in connection with any sale, offer or solicitation of an offer to buy any securities.

NOW AVAILABLE...

Here is one of the most comprehensive engine-driven compressor bulletins ever published. Even if you are not in the market for compressors at present, you will find this book educational and, we believe, interesting. Its 48 pages contain many operational and control diagrams, interior and bisected views, sectional drawings, installation pictures, detail explanations, and a wealth of other instructive material. Write or use the coupon below, and your copy will be sent at once.

THE COOPER-BESSEMER CORPORATION

MOUNT VERNON, OHIO

Please send me a copy of the new 48-page GMV Bulletin.

NAME_____ **Title**_____

COMPANY_____

ADDRESS_____

VOLUME 164
NUMBER 5

AMERICAN GAS JOURNAL

ESTABLISHED 1859

WHOLE
NUMBER 3867

MAY 1946

PUBLISHED MONTHLY BY
AMERICAN GAS JOURNAL, Inc.
53 Park Place, New York 7

S. G. KRAKE, *President and Treasurer*

M. E. KELLEHER, *Secretary*

S. G. KRAKE, *Managing Editor*

H. T. MATTHEW, *Business Manager*

JAMES C. MUNN, *Midwest Representative*
10515 Wilbur Ave., Cleveland 6, Ohio
Tel. Sweetbrier 0052

SCOTT KINGWILL, *Western Representative*
35 E. Wacker Drive, Chicago 1, Ill.
Tel. State 4227

Copyright, 1946, American Gas Journal Co.

Subscription $2.00 per year U.S.A.; $3.00 Canada; $4.00 Foreign. Single copies, 25 cts.

CONTENTS

The Natural Gas Industry—Its Problems and Outlook—Garnault Agassiz 11

World's Largest All-Welded, 5 Lift Wet Seal Holder at Long Beach, Cal.—Fred A. Herr 15

The Gas Industry of Belgium—John L. Turner 21

Automatic Loading of District Governors—Frank J. Woolfenden 27

Detroit Method of Sales Training—M. W. Bowman 31

Toledo Conference Huge Success 35

Large Volume Water Heating—Chapter IV—Part 2—Malcolm B. Mackay 39

New Gas Explosion Suits—Leo T. Parker 45

22nd Annual Distribution Conference A.G.A. 48

Joint National Accounting Conference 51

Safe Distribution Practices 52

Gas Holder Painting by Flotation 55

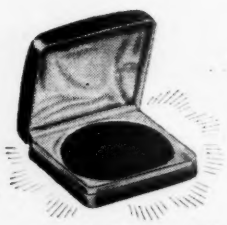
American Gas Association Activities 57

Chemicals from Natural Gas 58

High Pressure Gasification of Coal 58

News of the Gas Industry 59

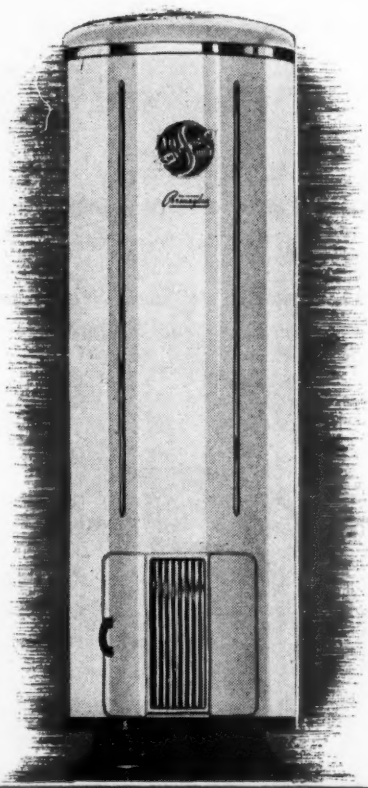
All of the research, all of the 23,000 test years, all of the engineering skill that are a part of the SMITHway *Permaglas* Water Heater are there for one purpose only—to deliver sparkling clean hot water as pure as the source itself!



There's Only ONE *Permaglas*

SMITHway Water Heaters are lined with *Permaglas*—the sparkling blue, mirror-smooth glass-fused-to-steel. *Permaglas* CANNOT rust or corrode under *any* water conditions.

Get the whole *Permaglas* story now. Send today for the booklet, "The Inside Story of Permaglas." It's packed with sales appeal!



PERMAGLAS... a Great Aid to Sales

SMITHway *Permaglas* Water Heaters give you the most powerful *new* sales story in the gas appliance business.

The monoquad glass-lined tank. Clean as a polished drinking glass. No tank-corrosion in the bath . . . no "tank-spots" on clean laundry. Sparkling clean hot water as pure as the source itself!

Plus 7 other great features that challenge all comparison!

Heated with Gas . . . Stored in Glass

SMITHway *Permaglas* WATER HEATERS

A. O. SMITH Corporation

NEW YORK 17 · PITTSBURGH 19 · CHICAGO 4 · TULSA 3
HOUSTON 2 · DALLAS 1 · LOS ANGELES 14 · SEATTLE 1
INTERNATIONAL DIVISION: MILWAUKEE 1—In Canada: JOHN INGLIS CO., LIMITED

MAY
1946

AMERICAN
GAS JOURNAL

VOLUME 164
No. 5

The Natural Gas Industry— Its Problems and Outlook

By
Garnault Agassiz

HAVING EMERGED from the uncertain days of war with an extraordinary record of achievement and service, the natural gas industry faces the future with the reasonable expectation of not only consolidating its remarkable gains of the past four years but of moving forward as never before in its long and colorful history.

Certainly the industry's outlook is most promising, not only as it applies to fuel but to its various other applications such as the production of carbon black, helium, synthetic rubber, plastics and other chemicals which recent technological developments have brought within its sphere.

Difficult Problems Lie Ahead

In the period of transition that lies immediately ahead, however, many problems will have to be faced, but these are not insurmountable for the very good reason that the foundations of the industry are strong, and its leaders are men of vision and action. For the most part, the problems are not new. Some have been with the industry always; some have had their genesis in the war effort, while yet others, like Topsy, have just grown, the logical result of an inordinate expansion.

As always, a major problem of the immediate future will be competition for the utilities' business by others fuels, accentuated, perhaps, by the war-increased efficiency of coal and other fuels. However, the world's most efficient single source of heat, functioning under a system of free enterprise, can hold its own against competition from any source. Even the threat of atomic energy, harnessed to do the will of man, should not cause the natural gas man anxiety, for its present cost is prohibitive, authorities asserting that it would require an investment of $10,000 to produce the equivalent amount of power as a cubic foot of natural gas at 25 cents.

The Problem of Federal Control

Perhaps the chief of all the problems confronting the natural gas industry, looming large and ominous, is the threat of its control by the Federal Power Commission. To such control all elements in the gas industry are unalterably opposed. The states, and naturally, regard the efforts of this Commission as an usurpation of their sovereign rights, and producers, distributors, processors, and utilities are united practically to a man in opposition to it.

As is known, the Federal Power Commission has just held at Charleston, West Virginia, the last of its open hearings which have been held for the ostensible purpose of gathering information on all aspects of the natural gas industry that will serve the purposes of Congress in its efforts to revise the Natural Gas Act.

Now neither the states concerned nor the industry as a whole are opposed to this investigation, even though a majority of them feel that it will achieve little of a constructive character. What they do oppose, apparently, is the utilization of these studies as a red herring across the trail to hide their real purpose, which is universally interpreted as a bold attempt of the F.P.C. to obtain absolute control of the production and distribution of natural gas.

It is the unanimous opinion of the state authorities and the gas industry that Congress, in enacting the Natural Gas Act, had no intention of conveying to the Commission the powers that inherently belonged to the states. Nor did the Commission itself, they maintain, until recently claim that such powers had been invested in them. In support of this they point to the following excerpt from the Federal Power Commission's annual report, dated January, 1944:

"It has been the unanimous view of the Commission that inasmuch as Congress has not given it comprehensive powers to deal with the end uses for which natural gas is consumed, and has granted the Commission no authority to regulate rates for the direct sales of natural gas to industry, it was the duty of the Commission not to seek to exercise such authority until the Congress amended the Natural Gas Act to confer on the Commission such specific powers as Congress desired it to exercise."

A Question of States' Rights

The attempt of the Federal Power Commission to obtain control of the natural gas industry through a revision by Congress of the Natural Gas Act is being violently opposed by all the states in which this resource has an economic importance. Their unanimous attitude is well expressed in the following statement at the Charleston, West Virginia, F.P.C. hearing last March by Governer Clarence W. Meadows: "My state will resist to its utmost any attempt of this Commission to control

in any way the production, distribution, or consumption of natural gas within its own borders."

There is general agreement among gas men that there is need for coordination of state and national policies, both as they attain to oil and gas, but control should remain in the hands of the states, which should develop their own policies to suit their own conditions. The right of each state to make its own regulations, such, for example, as proration laws, should be inviolate. All interests are agreed to this.

However, it is incumbent on those who are engaged in the industry to put their own houses in order. Producer, distributor, processor, in their own interests, should develop their businesses on a foundation of sound economics, not leaving regulation to the authorities alone.

The Problem of Future Supplies

Another of the intricate problems of the natural gas industry is that of guarding against a depletion of future supplies, for it is only through uninterrupted deliveries of fuel that the pipeline company or distributor can operate.

Since the birth of the industry the threat of utter exhaustion of natural gas reserves has always hung over the industry like the sword of Damocles, ever ready to fall, but invariably this threat of depletion has been removed by new discoveries or larger recoveries than anticipated from proven fields. The Dallas, Texas, geologist, E. De Goyler, a recognized authority on the subject, estimated that, as of January 1, 1945, the country's aggregate reserves of natural gas, excluding West Virginia—where gas is found in isolated pools, the content of which is difficult to estimate—approximated 170 trillion cubic feet. Only recently, however, as a witness before a hearing of the F.P.C., he stated that it might be necessary to revise his former estimate to a much higher figure, perhaps 170 trillion. It must be remembered, too, that Mr. De Goyler bases his calculations only on fields having great visible reserves.

Prediction of Natural Gas Reserves Difficult to Make

Because of the effect that exploration for oil has on the finding of natural gas, it is difficult to forecast with any degree of accuracy the nation's reserves of this valuable fuel. Twenty-five years ago, for instance, total reserves were estimated to be at the greatest not more than 15 trillion feet, and even ten years ago, after the great discoveries of the Monroe and Panhandle fields, in Louisiana and Texas respectively, authorities placed the outside figure at 40 trillion, and the life of the fields at not more than 20 years. Today, utilizing the DeGoyler figure of 170 trillion, the country's aggregate reserves are great enough in themselves to provide industry with three and a quarter billion cubic feet of natural gas a day for more than a century.

In the following table are shown present reserves of the chief producing states and the approximate annual withdrawals:

Proven Reserves and Annual Withdrawals of Natural Gas
Millions of Cubic Feet

State	*Proven Reserves*	*Annual Withdrawals*
Appalachian Region	5,000,000	475,000
California	30,000,000	455,000
Kansas	11,000,000	133,000
Louisiana	17,000,000	505,000
New Mexico	1,500,000	75,000
Oklahoma	18,000,000	285,000
Texas	83,000,000	1,323,000

Other Factors That May Increase Supplies

In any computation of natural gas reserves in the future, other factors than new discoveries will have to be taken into consideration. Chief of these, of course, will be the increased utilization of casing head gas, still going to waste in a very large way, although being used in greater quantities than formerly, particularly in the manufacture of carbon black. The adoption of more stringent conservation measures will also contribute to an increase of reserve supplies, as every cubic foot of fuel saved will leave another foot in the reservoirs. Then, undoubtedly, future prices of gas at the well head will be higher than now, which will influence the oil operators to save it, and perhaps lead them to drill for gas for its own sake. Who can tell, indeed, that the day may not come eventually when the once despised natural gas may not become more valuable to the petroleum producer than the oil itself?

Still another factor that may help to increase immeasurably the country's natural gas reserves is the recently perfected portable compressor, which makes possible the recovery of natural gas from partially depleted and low pressure areas, such as are to be found in such profusion in many parts of the Appalachian Region. Then there is the recent discovery by the Oil and Gas Division of the Bureau of Mines that helium, a United States Government monopoly, can be effectively employed as a tracer for both gas and oil.

Special A.G.A. Committee to Study Reserves

Statistics are becoming more important to all industries, and that of natural gas is no exception. In recognition of this importance, the American Gas Association has recently appointed a special committee to study the question of gas reserves in the five chief producing regions. It will be under the general chairmanship of N. C. McGowen, president of the United Gas Corporation, and will report to the Association annually.

Extent and Importance of the Industry

How important the natural gas industry has become to the country's economic scheme is vividly shown by the Bureau of Mines' comparative production figures by States for the years 1938 and 1943 shown in the following table in millions of cubic feet:

	1938	*1943*
Arkansas	11,301	36,469
California	315,168	457,757
Colorado	1,904	6,445
Illinois	1,169	18,120
Kansas	75,203	133,729
Kentucky	41,163	92,364
Louisiana	283,899	505,294
Michigan	10,165	18,206
Montana	21,216	31,562
New Mexico ...	50,705	86,500
New York	10,402	8,062
Ohio	35,257	52,001
Oklahoma	263,164	285,045
Pennsylvania ..	76,547	93,543
Texas	882,473	1,323,885
West Virginia .	134,342	223,787
Wyoming	26,678	34,351
Other	54,806	37,569
Totals	2,295,562	3,414,689

Of all natural gas marketed in 1944, it is estimated that nearly 79 per cent was used industrially, 16 per cent for domestic purposes, and 5 per cent in commercial operations. At points of consumption the fuel had a total value of $825,000,000 in 1944, compared with a figure of $577,000,000 for 1940. At the well head, natural gas had an average price of 5.4 cents a thousand cubic feet; at the point of consumption 21 cents. The field price was just one cent above that prevailing in 1940, while the average price at the point of consumption remained stationary, chiefly because of a 4 cent reduction in the domestic and commercial average price in 1944, attributable, of course, to the unwillingness of the regulatory bodies to permit the gas utilities to pass at least some of the burden of increased operational costs to the consumer; in fact, the trend has been to enforce further reductions wherever possible.

A Quarter Century of Consistent Growth

How consistent, if not spectacular, has been the growth of the natural gas industry in the past 25 years is vividly illustrated by the chief statistics for the quinquennial periods 1920 to 1945, the figures from 1930 to date being those of the Statistical Department of the American Gas Association and those of the 1920 and 1925 years the Bureau of Mines:

Year	*Sales MCF.*	*Customers*	*Revenues*
1920	798,000	3,433,000	$305,000,000
1925	1,188,000	4,020,000	305,000,000
1930	1,001,000	6,549,000	399,977,000
1935	1,068,000	6,956,000	389,984,000
1940	1,459,000	8,165,000	506,209,000
1945	2,148,000	9,497,000	676,686,000

The above figures are for the gas utility industry only, and do not include the fuel consumed in the manufacture of carbon black, the production of gasoline, in field operations in either gas or oil industries, or in certain other industrial activities, which, if added, would increase total sales by at least 500,000,000 mcf., and aggregate revenues by at least $200,000,000. Compare the above figures with those for 1900, when total consumption amounted to only 160,000,000 mcf.; total number of customers to about half a million, and operating revenues to less than $25,000,000. Today more than forty million persons are served with natural gas either in pure form or mixed with the manufactured product, and nearly 65,000 find gainful and steady employment in the industry.

The Nation Becoming Gas Conscious

In recent years the country has become natural gas conscious, especially in the states of large production. The order of the day is conservation, and in some instances, perhaps, it is being carried to an extreme. Louisiana, for example, where for years billions upon billions of cubic feet were permitted to go to waste, and where markets for it were simply non-existent, is attmepting to place a total inhibition on further exportations. Such restriction attempts are not new. As far back as 1907, a statute with the same object in view was passed by the Oklahoma legislature, but it was declared unconstitutional by the United States Supreme Court, as will all similar laws that interfere with free commercial intercourse between the states. Certainly, no one would suggest that Pennsylvania could prevent coal being shipped beyond her borders; why then gas from Louisiana or any other State?

Extreme Conservation Measures May Have Their Repercussions

Aside entirely from the legality of such restraints, there is the question of the wisdom of such policies, the effect, for example, upon the state itself. If the transportation of natural gas is prohibited, where will markets be found for it. It is an easy matter to talk about the development of vast industries predicated on a superstructure of natural gas, rubber, plastics and other chemicals, and, perhaps industries not yet thought of, but the success of these is necessarily hypothetical, to say the least, for natural rubber may again assume its pre-war importance and competitive materials for the manufacture of plastics and chemicals may make the use of natural gas uneconomic, if not impossible. What, too, one is prone to wonder would be the effect of such rigid restrictions on intrastate domestic and other rates? Certainly, not favorable.

Some States Have Large Surpluses

Apparently, in some parts of the country, there is a disposition to overlook the fact that the supplies of natural gas are so large that there are bound to be exportable surpluses for years to come. Left in the ground against the contingencies of the future this gas would represent no tangible asset, and, through contingency, might be lost to the state forever.

Special Gathering Taxes

Nor is the form of discriminatory taxation now being proposed in the form of increased gathering imposts salutary or wise. Such form of taxation will increase the revenues of the states concerned, no doubt, but its conservation effect would be relatively small, unless so large as to put full stoppage to transmission, in which case it would defeat its own ends.

Conservation A Vital Need

That natural gas conservation is a matter of importance to the states concerned and the industry itself no one can deny. A majority of the producing companies realize this, as do the pipeline systems, some of the larger petroleum organizations, and many of the independent producers, and many of these are working together in an effort to control production and distribution effectively and conservatively.

Constructive Work of Texas Railroad Commission

Foremost among the states which are attempting to conserve its supplies of natural gas is Texas, whose regulatory body, the Texas Railroad Commission has done yeoman work, not alone in making oil and gas producers alive to the importance of conservation to their own businesses, but in introducing far-reaching measures of control, such as reasonable ratios between oil and gas in petroleum production, the enforcement of pressure maintenances, recycling, and liquid petroleum recovery. It is the hope and belief of the Commission that one day in the not too distant future no gas will be flared in Texas, and that the gas from every barrel of oil will be utilized in some economic way.

Good Work of Louisiana Conservation Commission

Louisiana also has taken constructive steps through its State Conservation Commission in inculcating in the minds of its oil and gas operators the necessity of adequate protection of its petroleum resources. It has backed up its educational program with stringent regulatory measures that have had their effect. Only five years ago, for example, oil operators were permitted to flare gas with little restraint. Then a ratio of 4,000 cubic feet of gas to a barrel of oil was set, and recently the ratio has been still further reduced. It is the hope of the Louisiana authorities, also, that ultimately all gas now flared will be processed, and then either fed to the pipelines or utilized in the manufacture of carbon black and chemicals, or as a fuel for its own diversified industries.

Gas-Minded Governor At Helm in Kansas

Kansas is yet another state that is doing its utmost to conserve its reserves of natural gas. This state is fortunate in having as its chief executive the Hon. Andrew F. Schoeppel, a man who is not only gas minded, but is thoroughly conversant with the subject, having, before his election to the governorship being head of the Kansas Corporation Commission. He is also chairman of the Interstate Oil Compact Commission, a voluntary organization of states who have deposits of oil and gas, with the governor of each the ex officio member. This organization is accomplishing much in natural gas conservation.

Through its Corporation Commission, the State of Kansas is working closely with Oklahoma in forcing all companies to operate in the Hugoton Field on sound lines. Kansas, too, is a believer in the conservation of natural gas. It does not believe that gas should be exported from its confines on the basis of price alone, but it realizes that its own chief problem is to sell its gas, and at a profitable return. That is why it is not opposed to the use of the fuel for any economic purpose, and last year granted one of the large carbon black companies to withdraw large quantities of gas from the Hugoton Field on condition that it agreed to pay a minimum price of five cents a thousand cubic feet for it.

And in even thinking of carbon black one can not refrain from discussing briefly the industry which for so many years has been a pillar of the natural gas industry, providing producers a load of vast economic importance, and at times when no other outlets for the fuel were available.

In recent years, with the growth of what may be described as almost nation-wide distribution of natural gas there has been a temptation to condemn the use of this fuel in the manufacture of carbon black, forgetting altogether that it is virtually indispensable to the production of automobile tires, printing inks, paints, lacquers, and other essential products. Certainly one can not lose sight of the very obvious fact that it was carbon black that first brought prosperity to the natural gas fields of Louisiana and Texas.

Lately the carbon manufacturers have themselves become conservationists, and, through research and engineering skill, are exerting every effort to produce more black from a given amount of gas. That they have been successful is eloquently demonstrated by the statistics, which show that yields per cubic feet are increasing with great regularity.

Natural Gas Still Wasted

It must not be concluded from this discussion of conservation that the wanton waste of natural gas has been stopped completely, for this is far from the case. Unfortunately, billions upon billions of cubic feet are going to waste, notably in the Gulf Coast Region of Texas, but in many other areas of this and other producing states, most of it in connection with oil operations.

Vented Gas Presents Difficult Problem

The utilization of vented gas, or casing-head gas as it is generally called presents a difficult problem. The oil producers contend that the fuel has already performed its primary function of pumping oil, and in this respect differs in no way from the gas engine. The gas men and the regulatory bodies deny this, and they are becoming daily more insistent that this reckless waste be stopped for good.

However, there are obstacles in the way, for the utilization of gas being vented in what are essentially oil fields would require a comprehensive system of gathering lines and compressors both to maintain pressures and deliver the gas to the pipelines. Thus the matter becomes a question of economics, with price the dominant factor. No intelligent oil man would waste gas if he could dispose of it at a profit.

Price the Chief Problem of Industry

Price at the well-head is, perhaps, the chief of all natural gas production problems, and the independent producers maintain that it would correct many of today's misunderstandings, provided ratable taking was made mandatory everywhere, as it is in the oil industry. Ratable taking laws are now in force in some of the fields, such as the Texas Panhandle, and it is probable that it will become the general practice, otherwise some of the States affected may enact discriminatory legislation to force prices upward to much higher levels than those now prevailing. Already, the Oklahoma Corporation Commission has the power to fix such prices in cases of dispute.

Pipeline Companies Must Look to the Future

As the very future of the transmission systems is an adequate and continuous flow of natural gas, they are justified in doing everything within their power to safeguard their future reserves, certainly to the extent of owning at least 50 per cent of their own fuel. If they were forced to depend entirely upon the independent producers it is feasible to suppose that in seasons of high prices or duress, the latter might engage in a wild scramble to sell, leaving the pipeline companies absolutely helpless.

In general, the independent producers are not opposed to the pipeline companies' ownership of their reserves, but argue that in areas where sales are sufficient to set a basic field price this should be done. As one large independent producer of Texas expressed it: "The pipeline companies desire regulation in the field, yet are not willing to surrender their control of the market, which frequently amounts to a virtual monopoly."

It is the position of the independent producers, the regulatory bodies, and many of the utility executives that higher prices would increase the general prosperity of the industry, and that, if prorating were to become general it might remove entirely the threat of intervention on the part of the F.P.C. Under existing conditions, where this body is exercising jurisdiction, such as in the Panhandle

(Concluded on page 68)

World's Largest All-Welded, 5 Lift Wet Seal Holder at Long Beach, Cal.

By
Fred A. Herr

CLIMAXING a postwar gas system improvement and expansion program involving an outlay of approximately $1,250,000 during the past year for expanded storage holder, compressor and dehydrating plant facilities, the Municipal Gas Department of Long Beach, Calif., placed in operation a new 5,000,000 cubic foot telescopic gas holder.

This latest addition to the city's gas production and distribution facilities is the world's largest all-welded panel type wet-seal gas holder and was erected at a cost of $632,000.

When initial construction work was started by Stacey Bros. Gas Construction Co., of Cincinnati, O., in July, 1945, the project represented the first large gas holder erected on the Pacific Coast since 1941. Priorities for the steel and allocation of the then restricted materials were obtained from the War Production Board following a thorough investigation of the essentiality of the undertaking.

In Operation by May 1

In mid-March this year W. H. Partridge, superintendent of the Long Beach Gas Department, reported to AMERICAN GAS JOURNAL that only the "finishing touches" remained to be placed on the project and that the holder would be connected to the city's gas system by April 15 or May 1.

The location of the new holder is 70th Street and Cherry Avenue, a few blocks inside the Long Beach northern city limits. The site is near the compressor facilities which the department has operated for many years at Cherry Avenue and Artesia Street, where a new $208,700 compressor station was recently completed with which the gas from the new holder will be pumped into the system.

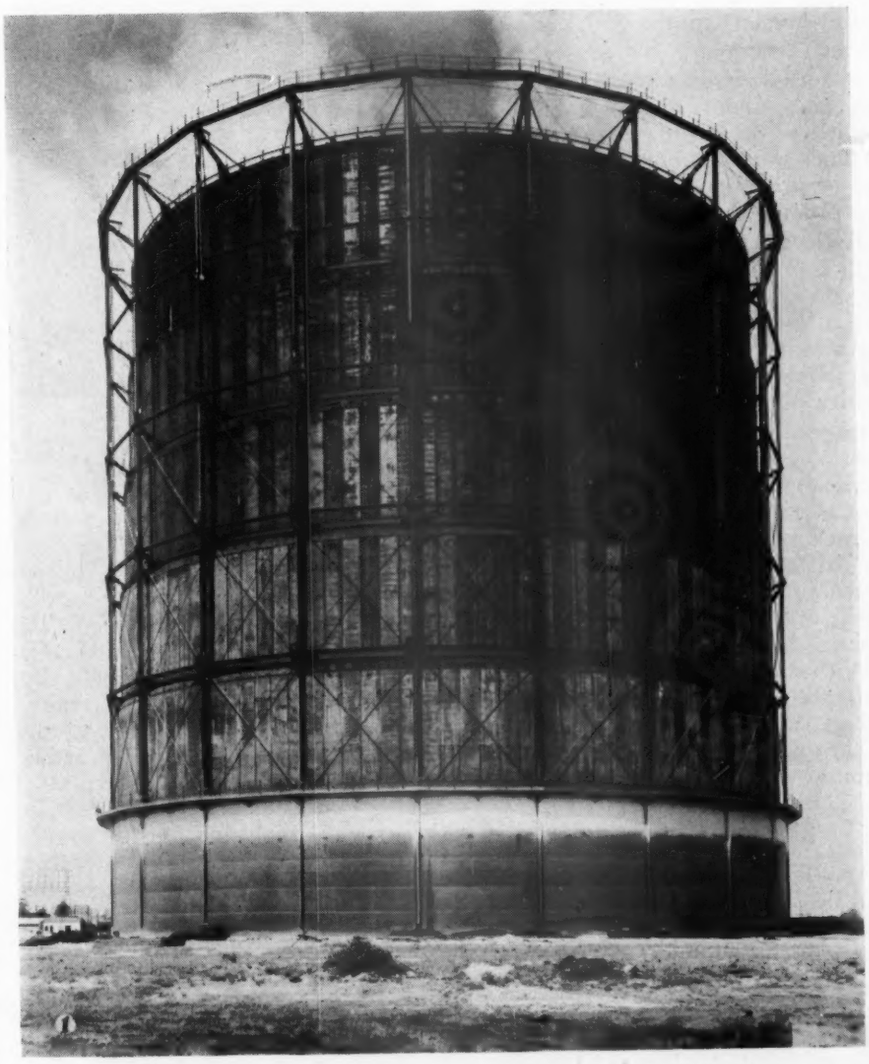


Figure 1: The new all-welded, 5 million cubic foot telescopic gas holder at Long Beach, California. It is 211 feet high from foundation to top of the guide frame.

Soil-Bearing Tests Made

The design and installation of the concrete foundation for a wet-seal holder of the type erected at Long Beach calls for a careful study and consideration of such factors as live loads, dead loads and wind loads. Predetermined soil bearing values are regarded as essential to ascertain the soil's ability to sustain the load to which it is to be subjected by the finished holder.

In the case of the Long Beach holder, poor drainage facilities and the irregular high water table of the holder's site on the flat tableland north of the Signal Hill oil field made extensive calculations necessary in respect to the bearing capacity of the soil in the vicinity of Cherry Avenue and 70th Street. The yard level there, for one thing, had to be raised three feet, for which purpose 25,000 cubic yards of compacted material were used.

A supporting understructure for the holder's concrete foundation (foundation diameter, 207 ft., 4 in.) was provided by driving 1,022 concrete piles 37 feet deep into the earth. Total concrete used for the foundation which was laid on top of the piling was 3,020 cubic yards, strengthened with 211 tons of reinforcing steel bars.

5 Lift—All-Welded Type

The new holder is of the 5-lift type. All welded construction was

used for the bottom, shell, cup and grip, intermediate sheets, crown and guide frame. The Stacey Co. reported that every inch of the welding done on the bottom was vacuum tested. This was done because of the tremendous weight on the bottom of the holder, the water load alone per square foot on the bottom of a five-million cubic foot holder being 2,220 lbs. per sq. ft. Compared with visual inspection, the vacuum testing has the advantage of locating minute pinholes, which reduces the possibility of corrosion in the bottom laps.

Tank Construction Detail

The steel tank of the Long Beach holder is composed of steel plates varying from ½" to 1⅜" in thickness, the thickness of each ring of plates being determined by the diameter and height of the tank, joint efficiencies and desired stress. This is the largest welded tank in this application. To check the quality of

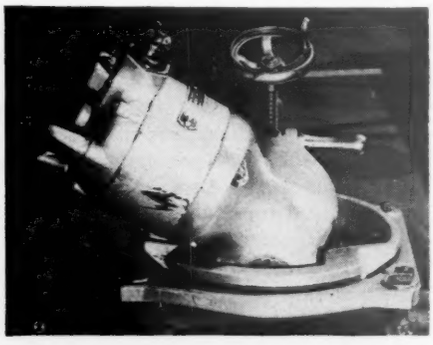


Figure 2: Weldprober for cutting test segments of welds.

welding, test segments were cut from the welded shell seams, as required by the A.E.S. These segments were etched, in order to inspect for porosity or slag inclusions. The equipment called "Weldprober" for cutting segments is shown in photo Fig. 2.

The rewelding of the opening left after any segment was removed was easily done because both sides of the slot are tapering to the bottom of the cut.

Lift Design

The lifts were designed to a new patented principle, which had proved itself on many gasholders since the inception of the panel type holder in 1936.

On the Long Beach holder the intermediate sheets run vertically, permitting larger sheets to be used and a larger amount of prefabrication to be done in the shop, such as attaching the vertical legs, etc. The progress picture Fig. 3 shows the inside view of the panels with the verticals.

Seal-Welded Vertical Legs

On the interior of each section there is provided a series of structural members called "vertical legs," referred to previously. These legs act only as stiffeners in the inner shell although on the adjoining sections they serve as stiffeners for the shell as well as guide rails for the bottom carriages attached to the top assemblies of each lift. All vertical legs on the holder are completely seal-welded to the shells which, it is claimed, eliminates corrosion building up between the plating and the members.

On an all-welded panel type holder of the Long Beach type 50% more vertical legs and 50% more bottom carriages are used than are normally installed on gas holders. This additional reinforcing, it is claimed, not only adds more rigidity to the shell but also gives a more uniform carriage contact around the perimeter of each section.

A series of rest pads consisting of flat bars about one inch thick is welded to the inside web of the cup channel so that the water in the cup can be properly displaced when each lift picks up the adjoining section.

Each holder section is provided with a manhole at the lower part of the shell. This provides access between the sections during the erecting and for general servicing when the holder is temporarily out of service.

Intermediate sections are practically the same design as the inner section described above, except that a grip assembly is provided at the top of each section in multiple-lift holders of the type erected at Long Beach. The grip assembly is composed of the top hanging row, grip channel, and grip and dam plates.

With the exception of a bottom curb placed on the outer section in lieu of the cup assembly, the design of the outer section is the same as adjoining intermediate sections.

22 Top Carriages

Attached to the top of each section are structural assemblies which guide the holder sections when in operation. There are 22 top carriages in the Long Beach holder to conform with the number of columns, and also three bottom carriages on each section per column by in lieu of the usual two carriages per bay.

Both top and bottom carriages on the Long Beach holder are adjustable in order to assure uniform contact with the vertical legs and guide frame columns. Stacey Bros.' practice is to adjust bottom carriages on new installations from a raft after the holder is completed and filled with air, a procedure which was carried out on the Long Beach job. This practice is said to assure uniform distribution of the stresses imposed on the carriages when the holder is in service.

The guide frames in the new holder consist of a series of columns spaced equally around the circumference of the walkway. Twenty-two columns were used on the project, using double I-beams made into Tee sections. Adjustable wind ties are provided on the top of the guide frame.

Figure 3: Inside view of the panels with the verticals.

In order to erect economically such a large structure a track was laid for bringing the incoming material close to the erection site, shown in Fig. 4. The erection proceeds by means of a trammel, operated also on a circular track laid temporarily on the bottom of the water tank. Fig. 5 shows the lifting of a group assembly of panels being lifted inside of the tank for assembly of a lift. This group assembly was welded on the ground, replacing vertical welding by flat welding. Fig. 6 shows the plan view of the permanent frame, which support the inner lift, when it is deflated. Portion of the crown is in progress of erection.

Built to Resist Earthquakes

Since the Long Beach area lies within the Southern California earthquake zone in which tremors of varying intensity occur from time to

time (the most severe, March 10, 1933, caused $10,000,000 damage in Long Beach), earthquake resistance factors were given careful consideration when plans for the holder were drawn. The holder is built to resist earthquake shock. A special investigation of earthquake stresses and computations was made which included allowances for turbulence in the 36,000 ton water seal as well as for seismic impact on the dead weight of the structure.

The Long Beach holder weighs 2,335 tons and is 211 feet high from foundation to the top of the guide frame. Other statistical data on its design are:

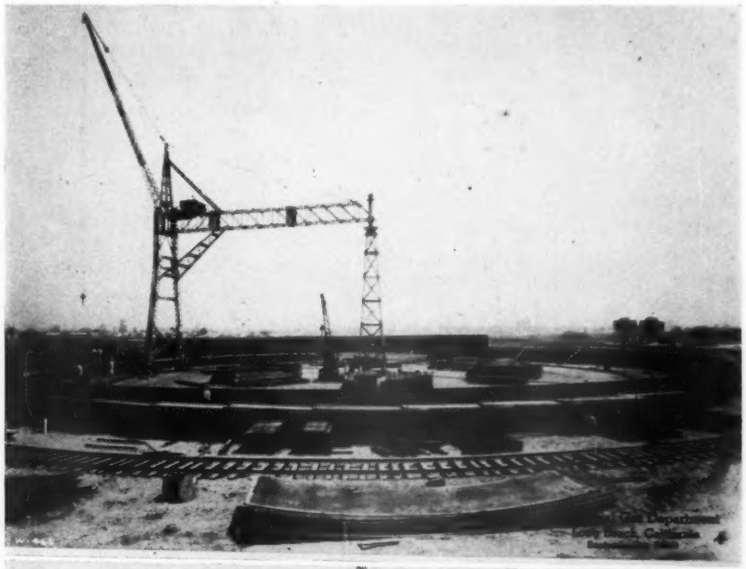
Capacity, 5 million cubic feet; number of lifts 5; tank diameter, 204′; tank height, 35′9″; number of columns 22; water load per square foot on bottom 2,220 lbs. per sq. in.; water required to fill tank, 8,709,700 gallons. Pressure of the various lifts inflated with air is as follows: 1st, 5.2″; 2nd, 7.5″; 3rd, 9.6″; 4th, 11.7″; all, 13.5″.

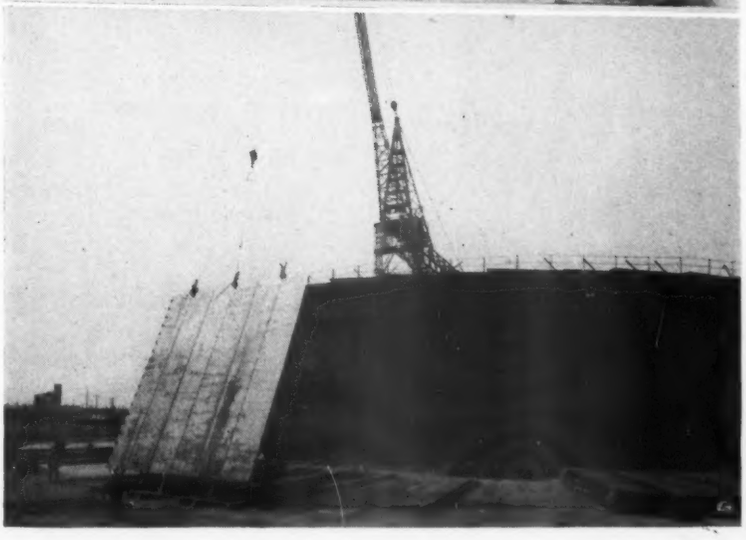
Used for Reserve Gas Storage

The gas department of Long Beach decided on the construction of the new holder some two years ago in order to provide reserve storage to meet the high peak loads which resulted from the increased industrial activity in that area of Los Angeles county during the war years. Men and women attracted to the airplane, shipbuilding and other war plants that were established in the Long Beach harbor district and its outlying industrial sections increased the city's population by some 100,000 half way through the war, indicating the need for expanded gas facilities.

This, Superintendent Partridge declared, created a potentially heavy demand for gas throughout the heating season and at the same time posed the problem of conserving local supplies of natural gas to meet the essential demands of the war effort.

Figure 4: Foundation with track spur in the foreground. Fig. 5: Lifting a group of assembly panels.





Four Other New Holders Built

In addition to the 5 million cubic foot storage holder, the gas department initiated an expansion program which called for the expenditure of a sum nearly equalling the $632,000 which the wet-seal holder cost.

The program included construction of four high-pressure gas holders of 500,000 cu. ft. capacity each at Spring and Junipero Streets in Long Beach at a cost of $303,000; and a new dehydrating plant in the Long Beach Harbor District, convenient to the oil wells on city-owned harbor land from which the bulk of the gas supply now is derived. The dehydrating plant, which cost $42,000, and the high-pressure holders, were completed in 1945.

New $208,700 Compressor Station

A new compressor station for use in pumping gas from the 5-million cubic foot holder into the system was completed last year at a cost of $208,700. The station is situated on the east side of Cherry Avenue, just north of Artesia Street, not far from the new wet-seal holder it is designed to serve.

The Oil Field Construction Co. of Long Beach handled the construction on this project. The compressor station consists of a 26x82 foot compressor building and an 80x18 foot garage and storage building, both of steel frame construction with corrugated asbestos siding and roofing.

The station is equipped with three Parks compressors with a total of 1,000 h.p., and water and oil pumps and water cooling system of a design equivalent to that compressor capacity. Plans for the compressor station were prepared by the Mel-Mar Co., Glendale, Calif., engineering firm.

Additional postwar modernization of the Long Beach gas facilities is provided for in a contract awarded on March 5, 1946, to Stacey Bros. That contract calls for general repairs to the existing 100 million cubic foot gas holder at an estimated cost of $60,000.

Gas From Signal Hill Wells

Gas has been distributed municipally in Long Beach since 1924. The city owned water lands on Signal Hill at the time oil was discovered on the elevation north of town in 1921. Tracts of water department land located on the western slope of the hill were leased to a private oil

developer in 1922 on a royalty basis. The first gas was obtained from petroleum wells located on city-owned waterland leases in Signal Hill oil field in 1923-1924.

During the height of the Southern California oil boom in the early 1920's, notably in the Signal Hill, Santa Fe Springs and Huntington Beach fields, the almost universal practice was to let the gas from producing oil wells escape into the air. Millions of cubic feet per day were dissipated in that manner at some of the larger gushers.

When it was seen that vast volumes of natural gas would be continuously available from municipally owned land in tested oil territory, a movement was initiated for the creation of a municipally-operated gas department to take advantage of the cheap natural gas supply at the city's doorstep. Up to that time Southern Counties Gas Co. served Long Beach.

78,000 Meters Now Served

A district bond issue was approved by the voters of the city in 1924 to provide funds with which to purchase the Southern Counties system within the city limits, or, if purchase negotiations failed, to parallel the Southern Counties lines with a city system.

Southern Counties Gas Co. subsequently sold its Long Beach facilities to the city for a price of approximately $250,000. There were then some 32,000 meters.

In 1931, the city of Long Beach bought for $300,000 the North Long Beach Gas System which served an area west and north of Signal Hill and consolidated its facilities with the main city system. Some 4200 meters were involved. In March, 1946, a total of some 78,000 meters were connected to the Long Beach gas distribution system.

Original Gas Source Diminished

Originally all gas for distribution was obtained from wells in the Signal Hill oil field. At the peak of that field's production in 1924, the gas department obtained 24 million cubic feet daily from oil wells on city-owned Signal Hill leases. Sixteen million cubic feet daily were derived from the Jergins lease on the west side of Signal Hill, and eight million cubic feet from wells drilled on land surrounding a water reservoir on what became known as the Reservoir Hill lease on the eastern slope of the oil field.

In the years which followed, oil production on Signal Hill suffered the inevitable decline inimitable to heavily drilled town-lot fields. The daily production, which exceeded 300,000 barrels per day for a time in the early 1920's, had dropped to approximately 25,000 barrels per day by the spring of 1946. Gas output, of course, dropped proportionately. Today the city of Long Beach received less than 500,000 cubic feet of gas daily from the nearly depleted wells on Signal Hill, according to Superintendent Partridge's estimate.

Harbor Wells Now Supply Gas

The main supply of Long Beach gas now is derived from oil wells drilled on city-owned land in the Long Beach Harbor District. The lands, owned by the Harbor Department, lie within what is officially known as the Wilmington oil field, named for Wilmington, the Los Angeles Harbor District community which borders on Long Beach.

The harbor area immediately adjacent to the piers is free of oil derricks, but the oil and gas pool underlying the transit sheds and docks and the ocean front is nevertheless being tapped. This is accomplished through "slant drilling." The pitch of the slant drilling operation in some wells makes it possible to slant a well as much as 1600 feet seaward from the derrick site. Oil and gas is being brought up from underneath the Long Beach turning basin through wells whose rigs stand 200 to 300 feet back from the waterline.

46,500,000 Cu. Ft. Daily

In March, 1946, there were some 225 oil and gas producing wells on city harbor land with a score or more in process of drilling. The resulting dry gas from city owned wells, totaling approximately 20,000,000 cubic feet daily, is delivered by the Harbor Department to the Gas Department for the domestic fuel supply of the city. The Gas Department has first call on all oil well gas which remains after plant gas and production gas needs (supplies used in oil operations) have been satisfied.

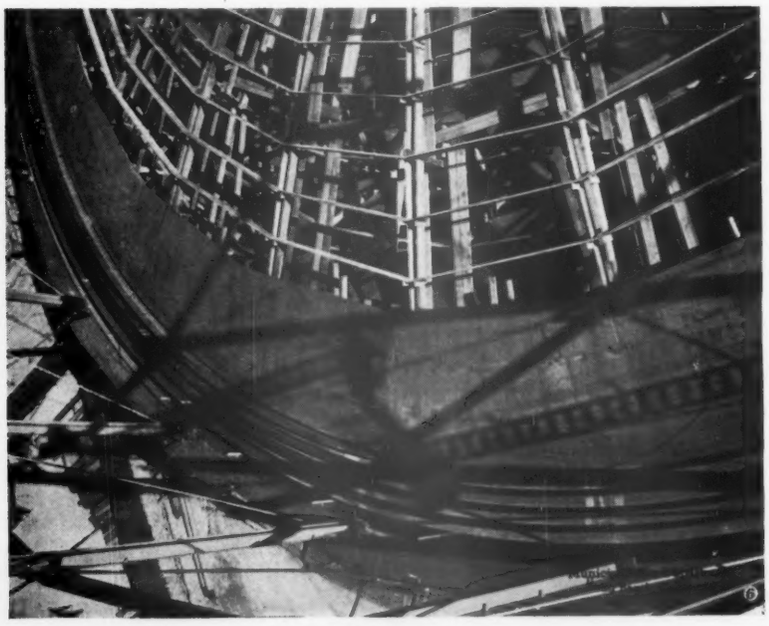
Wet-Gas Line to Signal Hill

The gas treatment plants were originally established on Signal Hill when that field was the largest yielder of gas. For that reason a considerable portion of the wet gas now produced in the Wilmington field is still transported through a wet-gas line from the Harbor District to treating plants on Signal Hill. This situation, however, was relieved somewhat by the recent opening of a new $42,000 dehydrating plant in the harbor area.

Administrative and executive offices of the gas department are housed in a 3-story Municipal Utilities Building in the Long Beach Civic Center, facing Lincoln Park in the downtown district.

Superintendent Partridge reported that the average annual income of the gas department is $1,000,000, and the top rate charged for gas in the 22 years the department has been functioning was 60c per 1000 cubic feet.

Figure 6: Plan view of the permanent frame which supports the inner lift when deflated.



DEVELOPMENTS

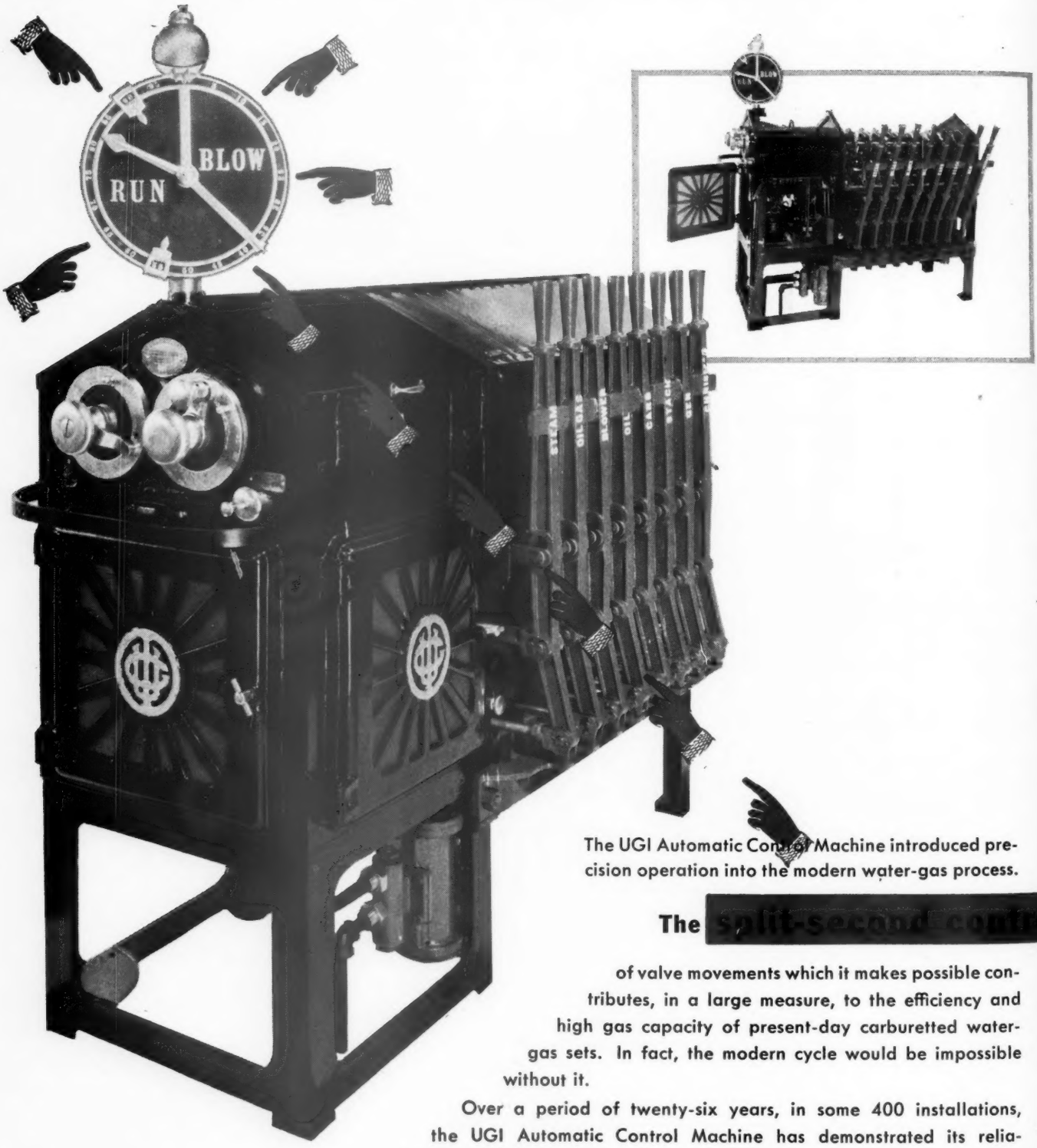
IN

GAS PLANT EQUIPMENT

UNITED ENGINEERS & CONSTRUCTORS INC.
NEW YORK PHILADELPHIA CHICAGO

UGI Equipment

U G I AUTOMATIC CONTROL MACHINE . . .



The UGI Automatic Control Machine introduced precision operation into the modern water-gas process.

The split-second control

of valve movements which it makes possible contributes, in a large measure, to the efficiency and high gas capacity of present-day carburetted water-gas sets. In fact, the modern cycle would be impossible without it.

Over a period of twenty-six years, in some 400 installations, the UGI Automatic Control Machine has demonstrated its reliability, its low maintenance cost, its flexibility in meeting the varying operating-cycle requirements of water-gas production for industries as well as utilities.

UNITED ENGINEERS & CONSTRUCTORS INC

NEW YORK 17 • PHILADELPHIA 5 • CHICAGO 2

63 YEARS' EXPERIENCE IN GAS-PLANT DESIGN, CONSTRUCTION AND OPERATION

The Gas Industry of Belgium

By
John L. Turner

MANUFACTURED gas plays an important role in the economy of Belgium. There is no natural gas. Belgium has 2671 communes of which 462 are supplied with gas. Of a total population of about 8,400,000, two-thirds (5,600,000) reside in communities having gas service.

Sources of Gas

In 1943 there were only 26 gas plants working. Four of these were in the cantons of Eupen and Malmedy, temporarily annexed to Germany. The remaining 22 produced only 99,804,568 cubic metres or 8.0% of the 1,253,251,713 cubic metres of gas handled in 1943. Coke ovens supplied the balance except for the negligible imports from France.

There remain only nine local plants supplying 17 communes. These are: Namur, Arlon, Deynze, Diest, Aerschot, Eupen, Malmédy, Herbesthal and St. Vith. There are six other plants, physically independent of each other and the grids, which are owned by companies supplying gas to several disconnected localities. These are: Audenaerde, Dinant, Gembloux, Hasselt and Tirlemont. Two communes are supplied by imports from France. All other communes (430) having gas are served by enterprises connected to one of the grid systems and making, if any, only a part of the gas requirements.

The gas grids are chiefly supplied by coke oven plants. Over 85% of the gas sold in Belgium comes from works capable of producing metallurgical coke. The Belgium gas industry operated at a high level of activity until the latter part of the German occupation. This was because of the value to the Germans of the metallurgical industries of Belgium The gas industry itself produces little gas. It is dependent upon the coking industry and is organized for the use of coke oven gas. It is mainly concerned with the transportation and distribution of gas.

Regulation

There is no national gas statute. Regulation of the industry derives from administrative application of the common law. The communal authorities, singly or grouped in inter-communal associations, either distribute gas themselves (en regie) or grant a concession to distribute within the area of their administration. The terms upon which concessions are granted partly vary with the extent to which financing is accomplished with public funds. They vary from time to time and place to place in provisions for control and participation in profits by the communal authorities. What is actually one organization may, if operating under concessions of different kinds from more than one authority, operate in the area of each under the name of a separate subsidiary company.

Gaseous Volumes and Calorific Value

Town gas has a standard calorific value of 4250 kilogramme calories per cubic metre measured dry at 0° C. temperature and at a pressure of 760 mm. of mercury. Gas sold to the public is normally adjusted to this quality before distribution. It is conventional in Belgium to express gaseous volumes saturated with water vapor and measured at 15°C. temperature and at a pressure of 760 mm. of mercury. One cubic metre of wet gas at 15°C. temperature and 760 mm. mercury pressure is equivalent to 35.31 cubic feet of wet gas at 60°F. temperature and 30 in. mercury pressure. Wet gas having a calorific value of 4250 kilogramme calories per cubic metre at 15°C. temperature and 760 mm. pressure is equivalent to 477.7 BTU wet gas per cubic foot measured at 60°F. temperature and 30 in. mercury pressure. Throughout this article, gaseous volumes are expressed in cubic metres saturated at 15°C. temperature and 760 mm. mercury pressure of gas having a gross calorific value of 4250 kg. cals. per cubic metre dry at 0°C. temperature and 760 mm. mercury pressure.

Coke Plants

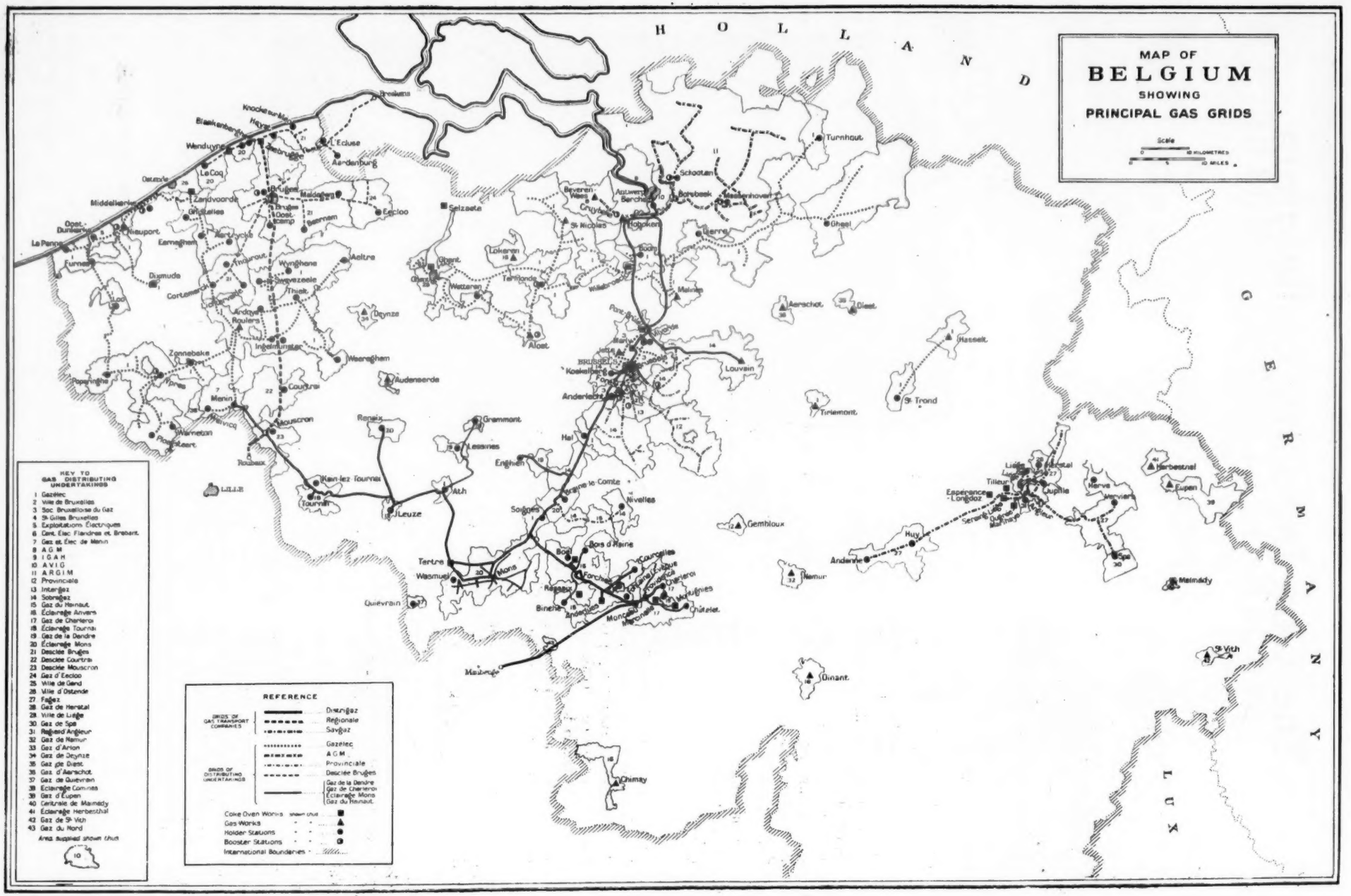
There are 20 coke plants in operation. The coke plants can be divided into three functional groups (a) situated at coal mines and producing coke for use elsewhere (b) integral parts of large iron and steel or chemical plants and (c) located at a distance from mines and industrial plants and making gas for the specific purpose of town supply. Five plants sell all surplus gas direct to industry. These are: Montignies, Marcinelle, Selzaete, Willebroeck and Tilleur. Nine plants give bulk supplies to industry as well as selling gas for general public consumption. These are: Ougrée-Marihaye, Seraing - Liége, Espérance - Longdoz, Terte, Boël, Marly, Monceau, Zandvoorde and Providence. Six plants dispose of all of their gas for public supply. These are: Pont-Brûlé, Bruxelles, Ghent, Ressaix, Anderlues and Vilvorde.

Low grade fuel gas produced in large quantities by blast furnaces associated with coke plants is often used for heating ovens. This is especially true where coke oven gas from the same enterprise is used for heating steel furnaces. Coke oven gas is preferred for heating blast furnaces because of its higher calorific value and greater purity.

A somewhat similar exchange takes place between coke plants and synthetic ammonia plants. Large quantities of coke oven gas are supplied the ammonia plants as a source of hydrogen. The hydrogen is separated by refrigeration and fractional distillation. The hydrogen free gas, commonly called in Belgium "rest gas," has a high calorific value. This is piped back to the coke plants where it is (a) used by the coke plant (b) compressed into cylinders and sold for highway transport, for which it is very suitable or (c) mixed with outgoing supplies for general public use.

Gas Pipe Line Grids

There are two types of gas transmission grids. The first type is that owned by companies operating over long distances at fairly high pressures and receiving their supplies from


MAP OF
BELGIUM
SHOWING
PRINCIPAL GAS GRIDS
Scale
10 KILOMETRES
5 10 MILES
HOLLAND
GERMANY
LUX
KEY TO GAS DISTRIBUTING UNDERTAKINGS
1 Gazélec
2 Ville de Bruxelles
3 Soc. Bruxelloise du Gaz
4 St-Gilles Bruxelles
5 Exploitations Électriques
6 Cent. Élec. Flandres et. Brabant.
7 Gaz et. Élec. de Menin
8 A G M
9 I G A H
10 A V I G
11 A R G I M
12 Provinciale
13 Intergaz
14 Sobregaz
15 Gaz du Hainaut.
16 Éclairage Anvers
17 Gaz de Charleroi
18 Éclairage Tournai
19 Gaz de la Dendre
20 Éclairage Mons
21 Desclée Bruges
22 Desclée Courtrai
23 Desclée Mouscron
24 Gaz d'Eecloo
25 Ville de Gand
26 Ville d'Ostende
27 Fagaz
28 Gaz de Herstal
29 Ville de Liège
30 Gaz de Spa
31 Regaud Ardeur
32 Gaz de Namur
33 Gaz d'Arlon
34 Gaz de Deynze
35 Gaz de Diest
36 Gaz d'Aerschot
37 Gaz de Quévrain
38 Eclairage Comines
39 Gaz d'Eupen
40 Centrale de Mamédy
41 Eclairage Herbesthal
42 Gaz de St Vith
43 Gaz du Nord
Area supplied shown thus
REFERENCE
GRIDS OF GAS TRANSPORT COMPANIES
Distrigaz
Regionale
Savgaz
GRIDS OF DISTRIBUTING UNDERTAKINGS
Gazelec
A G M
Provinciale
Desclée Bruges
Gaz de la Dendre
Gaz de Charleroi
Éclairage Mons
Gaz du Hainaut.
Coke Oven Works shown thus
Gas Works
Holder Stations
Booster Stations
International Boundaries
Ostende
Middelkerke
Oost-Dunkerke
Le Panne
Furnes
Nieuport
Dixmude
Eernegem
Westvleteren
Cortemarck
Roulers
Ingelmunster
Zonnebeke
Poperinghe
Ypres
Menin
Wervicq
Warneton
Ploegsteert
Roubaix
LILLE
Tournai
Leuze
Ath
Renaix
Mouscron
Courtrai
Deynze
Waregham
Audenaerde
Grammont
Lessines
Enghien
Quiévrain
Tertre
Wasmuel
Mons
Soignies
Binche
Braine le Comte
Hal
Nivelles
Bois d'Haine
Boussu
Forchies
Courcelles
Charleroi
Marchienne
Monceau
Châtelet
Maubeuge
Chimay
Dinant
Gembloux
Namur
Andenne
Huy
Tirlemont
Louvain
Aerschot
Diest
Hasselt
St Trond
Turnhout
Schoten
Borsbeek
Ghesl
Sierre
Beveren Waas
Antwerp Berchem
Hoboken
St Nicolas
Boom
Lokeren
Ghent
Wetteren
Termonde
Alost
Malines
Seizaete
Eecloo
Bernem
Aeltre
Wynghene
Thielt
Andyck
Deynze
Brussels
Koekelberg
Anderlecht
Liège
Herstal
Tilleur
Jupille
Esperance-Longdoz
Seraing
Ougrée-Marihaye
Verviers
Herbesthal
Eupen
Spa
Malmédy
St Vith
Liège
Louvain
Namur
Dinant
Spa
Verviers
Eupen
Malmédy
St Vith

coke ovens. These are called transport companies. The second type is that owned and operated by companies engaged in supplying gas direct to the public.

Transport Company Grids

The transport companies exist solely for the purpose of buying gas from coke plants, transporting it and selling it to other gas systems and to a few large industrial consumers. They are not concessionaires for the supply of gas in their areas. They own no low pressure distribution mains.

There are three transport companies. These are: S. A. deDistribution du Gaz (Distrigaz); S. A. pour l'Achat, la Vente et la Distribution du Gaz (Savgaz) and Compagnie Régionale de Transport d'Energie (Regionale).

Not shown in the map, is the gas works at Arlon (33) — population 12,000 in the extreme southeast zone of Belgium close to the Luxembourg frontier.

Distrigaz

Distrigaz is the largest Belgian gas grid system. It covers most of the central part of Belgium from Antwerp in the North to the French frontier at Maubeuge, France in the South. It extends from Charleroi in the East to Menin in the West. There are 226 miles of lines with diameters of from 6" to 20". The lines operate at pressures varying from 7 to 43 lbs. per sq. in. Distrigaz is connected with Régionale at Mouscron. It is connected with Compagnie Générale de Gaz et d'Electricite (Gazelec) at Malines in the North, at Menin in the West and at Gazelec's Jette plant at Bruxelles. A 20" loop line was laid in 1939 from the Pont-Brûlé coke plant just north of Bruxelles to the Hoboken water gas plant of Antwerpsche Gasmaatschappij (A.G.M.) near Antwerp. It receives gas from ten coke plants namely: Tertre, Pont-Brûlé, Boël, Marly, Monceau, Ressaix, Anderlues, Zandvoorde, Providence and Vilvorde.

There are five compressor stations. They are located at the following coke oven plants; Pont Brûle, Tertre, Marly, Monceau and Boël. Distrigaz owns all compressor installations except that at Boël. Piston type compressors are generally used. They are driven either directly by slow speed synchronous motors or by belt drive. Newer installations will probably use volumetric rotary compressors.

Telemetric devices are installed at advantageous points in the system in order that the central dispatching office can control the pressures. The company disposes of gas at about 60 different points. In order to overcome the problem of maintaining adequate pressures with only five compressor installations, the various consumers inform the company each day of the quantity that they expect they will require the following day. The dispatching office allocates the total expected requirement among the various producers in accordance with their respective productive capacities and pipe line pressures are adjusted accordingly.

The company owns no holders but certain of the coke plants and distributing companies do. Variations in consumption are chiefly compensated for by altering the speed of the compressors and by using the pipe line system itself as a holder.

All of the Distrigaz pipe lines are of steel with welded joints. Expansion joints are placed at intervals. So called "isolation joints" were originally installed when the lines were laid as a protection against electrolysis. These joints were placed at approximately 1500 ft. intervals in built up districts, every 3000 ft. in the suburbs and from 1½ to 2 miles apart in rural areas. The further electrification of the steam lines of the national interurban railway (Société Nationale des Chemins de Fer Vicinaux) and the progressive breakdown of the asphalt pipe coating made it necessary to resort to more efficient protection.

Where the pipe lines were located near to electric substations of the railway, "electric drainage" was accomplished by means of electrical connections with the sub-stations. Automatic cut-off devices were installed in order to prevent a reverse flow of current to the pipe lines at times when the sub-station would not be in operation. These automatically shut off the current when it tends to flow from the sub-station and remain closed until the direction of current flow is reversed. At points removed from the sub-stations cathode protection is utilized.

Savgaz

Savgaz serves the eastern part of the country in the area around Liége. It has no physical connection with the other grids. Its lines stretch along the River Meuse from Huy to Liége and Jupille with branches to Verviers and Spa. There are 55 miles of 4" to 12" line operating at a maximum pressure of 11 lbs. per sq. in. The system is supplied by three coke plants in the Meuse Valley in the vicinity of Liége. These are: Ougrée-Marihaye, Seraing-Liége and Espérance-Longdoz.

Regionale

The lines of Régionalé are in the western part. They run from Zeebrugge on the English Channel in the north to Mouscron on the French border in the south and extend to Roubaix, France. There are 42 miles of 10" to 15" lines operating at an average pressure of 21 lbs. per sq. in. At Mouscron it is connected with Distrigaz. It has been almost entirely dependent upon Distrigaz for its supply since the Zeebrugge coke plant was destroyed by bombing in July, 1943. The system supplies the three Desclee companies by connections at Zeebrugge, Bruges, Courtrai and Mouscron.

Distributing Company Grids

The second type of gas transmis sion grids, which are those operated by the distributing companies, are regarded as secondary to those of the transport companies. They are almost wholly dependent upon the transport companies. They operate in general at rather low pressures and, with the exception of one company, over shorter distances.

There are eight distributing companies operating grids. These are Compagnie Générale de Gaz et dÉlectricité (Gazelec); Antwerpsche Gasmaatschappij (A.G.M.); S.A.H. Desclée et Cie (Desclée Bruges); Société Provinciale du Gas et de l'Electricite (Provinciale); S. A. d'Eclairage du Bassin Houiller de Mons et Extensions (Eclairage Mons); Compagnie du Gaz de la Région de Charleroi (Gaz de Charleroi); S. A. de Gaz et Électricité du Hainaut (Gaz du Hainaut) and Compagnie d'Électricité de la Dendre (Gaz de la Dendre).

Gazelec

Gazelec with no fewer than four separate grid systems is the largest distributing company operating grids. The company has two large and two small grids. They are: (1) in West Flanders there are 177 miles of 4" to 10" lines operating at an average pressure of 5 lbs. per sq. in. This system is supplied by Distrigaz. (2) In East Flanders and Antwerp there

are 158 miles of 3" to 8" lines operating at an average pressure of 7 lbs. per sq. in. These lines are supplied by Distrigaz and by Gazelec's gas plant at Malines. (3) Around Bruxelles there are 22 miles of mains operating at between 3 and 4.5 lbs. pressure per sq. in. These are supplied by Gazelec's Jette gas plant at Bruxelles and by the municipal coke plant of the Ville de Bruxelles. Distrigaz also furnishes gas at the Jette plant. (4) St. Trond is supplied from Gazelec's Hasselt gas plant through 10 miles of 5" line operating at 2 lbs. per sq. in. pressure. Altogether Gazelec receives gas from the Ville de Bruxelles municipal coke oven plant, six company owned gas plants and Distrigaz.

Use of Gas—1943—in Thousands of Cubic Meters

	Coke Oven Plants	*Gas Transport Companies*	*Distribution Companies*	*Total*	*Percentage of Total*
Sold to Industry					
Iron and Steel Plants	241,345	35,709	—	277,054	22.1
Synthetic Ammonia Plants	196,220	—	—	196,220	15.7
Tar Distillation	10,149	—	—	10,149	0.8
Glass Plants	41,179	13,599	—	54,778	4.4
Unclassified	5,962	6,395	76,498	88,855	7.1
Total Industrial Sales	494,855	55,703	76,498	627,056	50.1
Motor Transport	50,558	2,794	38,635	91,987	7.3
Exports to France	—	14,641	1,911	16,552	1.3
Exports to Holland	—	—	967	967	0.1
Non-industrial sales	—	—	464,970	464,970	37.1
Used and Lost	—	7,580	44,140	51,720	4.1
Total	545,413	80,718	627,121	1,253,252	100.0

A. G. M.

The lines of this company are in the vicinity of Antwerp. It has 90 miles of 6" to 24" lines operating at an average pressure of 3 lbs. per sq. in. It has a water gas plant near Antwerp and a small gas plant at Beveren-Waes. It is supplied a large quantity of gas by Distrigaz at Hoboken.

Desclee Bruges

There are two Desclée grids. One serves the coastal area between Ostende and the Dutch frontier and extends as far as Breskens in Holland. It is supplied by Régionale at Zeebrugge. The other radiates from Bruges where it is also supplied by Régionale. Together they consist of 67 miles of 3" to 10" lines operating at an average pressure of 3 lbs. per sq. in.

Other Grids

The grids of Provinciale, Éclairage Mons, Gaz de Charleroi, Gaz du Hainaut and Gaz de la Dendre are of lesser importance.

Low Pressure Distribution

There are altogether 43 undertakings owning low pressure mains engaged in supplying gas to the public. This includes the eight above listed companies having grids.

Gazelec and its affiliated companies, is the most important distribution system from the standpoint of volume of direct sales to the public. Following in order are A.G.M. and its associated companies and the subsidiaries of S.A. Électricite et Gaz de l'Agglomération Bruxelloise (Electrogaz).

Gazelec distributes in a wide area in central and western Belgium including a sizeable portion of Bruxelles. It produces very little of the gas that it sells. A.G.M. serves in and in the vicinity of Antwerp. It produces only water gas at its Hoboken plant located just south of Antwerp. This is the largest strictly water gas plant in Belgium. Gas from this plant, enriched by coke oven gas from Distrigaz, constitutes nearly all of the supply. The subsidiaries of Electrogaz serve an area in the vicinity of Bruxelles. They are supplied by Distrigaz.

An important distribution system is that of the Ville de Bruxelles. This municipal system serves the central portion of Belgium's capital and largest city. The gas is produced in the municipally owned coke oven plant. This coke plant is the most efficient in Belgium from the standpoint of disposable gas per ton of coal charged.

The city of Ghent is supplied by the municipally owned system. Gas is furnished by the municipal coke oven plant.

Consumption

There are no seasonal variations in gas consumption. This is because a large part of the gas is normally sold to industry. There is only a trifling use of gas for space heating. The annual non-industrial consumption per capita is normally about 80 cubic metres (2800 cubic feet). This compares with many Continental countries but does not approach that of populous areas of Great Britain where the consumption would be two or three times as great.

The use of gas as a substitute for liquid motor fuel in motor transport is important. This business started at the beginning of the German occupation in 1940 as a result of the shortage of gasoline. About 75 gas filling stations were finally established in the principal towns.

Beginning with the latter part of 1943 the production and consumption of gas began to grow erratic. This was because of Allied air activity and the distortion of consumption caused by the pressing industrial demands of the German war machine. The figures for 1944 and 1945 are even less consistent but because of other factors. Consequently, an analysis of 1943 is here given as being the most nearly normal of any recent year. It will be noticed that in 1943 industrial sales consumed one half of the gas.

Sources of Gas—1943

Thousands of Cubic Metres of Standard Calorific Value	
Imports from France	1,170
Gas Plants	99,805
Coke Oven Plants	1,152,277
	1,253,252

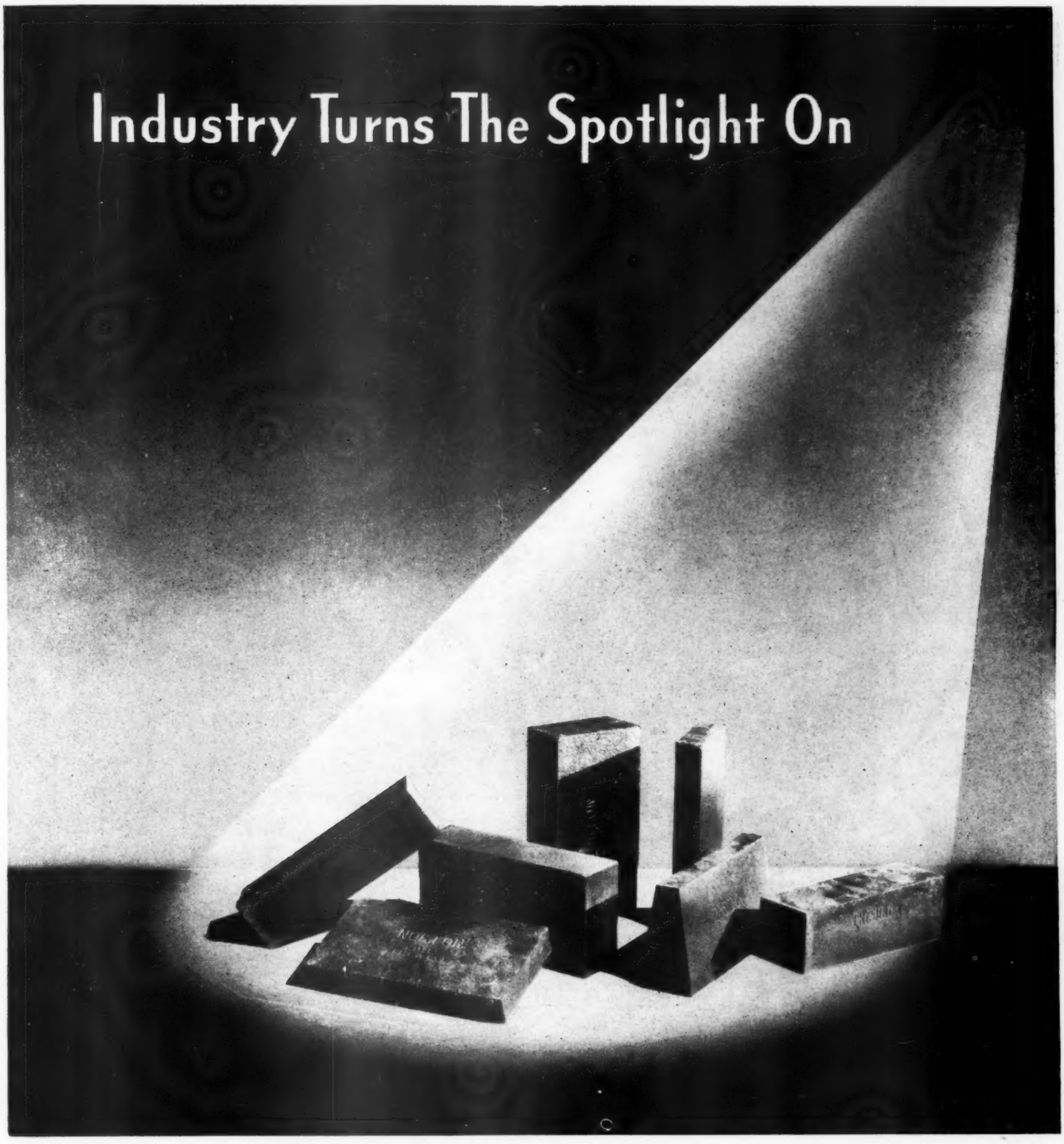
Analysis of use of gas—1943—in thousands of cubic metres of standard calorific value is given in above table.

Pemco Adds to Customer Service Staff

Pemco Corporation, of Baltimore, has recently announced two additions to their customer service staff: William Gladden, who will cover the Midwest Territory, and Harold J. Giraud, who will cover the West Coast.

Up to the war, Gladden had about 23 years of service with Pemco, his last activity being Field Engineer in the Service Department.

Harold Giraud, recently released from the Army, was associated with the Ed. Friedrich Manufacturing Company of San Antonio, Texas.



CRYSTOLON BRICK

Wartime peak operation emphasized CRYSTOLON Brick's outstanding quality—long, trouble-free service . . . a serviceability derived from these characteristics: (1) great refractoriness, (2) chemical stability, (3) resistance to abrasion, (4) resistance to the corrosive action of ash and the penetration of slag. Clinkers are so easily removed that a CRYSTOLON generator lining will often pay for itself in one year by savings in cleaning costs alone.

NORTON COMPANY **WORCESTER 6, MASS.**

How Vulcan's New MOLDED LOOP "Shapes Up" for Greater Accuracy

OLD STYLE LEATHER LOOP

THE NEW, IMPROVED VULCAN LOOP

Following years of exhaustive research, Vulcan now offers a MOLDED LOOP—the most advanced diaphragm design in gas meter history.

Compare the shape of the Vulcan Molded Loop with old style leather hand-fluted contours. Streamlined smoothness, precise uniformity and absence of wrinkles are salient features of this diaphragm. Note the natural "hinge" molded-in for uniform flexibility. This affords more sensitive operation, reduces differential pressures, and makes for more accurate metering.

The Vulcan MOLDED DIAPHRAGM is securely attached to the rings by special wire for a more positive seal. No more tying on by hand. No more cumbersome cord and bulk knots. No more tie leaks!

All these and other advantages of the improved VULCAN diaphragm insure greater accuracy and more dependable meter operation.

These are a few reasons why leading utilities are adopting this vastly improved diaphragm as standard equipment. Write the Meter Company or direct to us for details and samples.

VULCAN

PROOFING COMPANY

FIRST AVENUE AND FIFTY-EIGHTH STREET, BROOKLYN 20, N. Y.

Automatic Loading of District Governors

By

Frank J. Woolfenden

Engineer of Distribution Design
Michigan Consolidated Gas Company
Detroit, Michigan

PROBABLY the most serious problem now confronting the distribution engineer is pressure reinforcement of existing low pressure systems to adequately handle the greatly increased loads in residential sections due to the rapidly expanding house heating load. Distribution systems which were designed for ordinary domestic cooking and water heating service, are now called upon to carry this new load.

Gas house heating has been greatly increased in popularity by the recent oil rationing and the shortage of solid fuels. As an example, in Detroit there were added to our lines 1,900 units in December and 2,600 in January. Two-thirds of the installations were conversion burners placed in houses in areas already built up. Unfortunately, these installations have a habit of "bunching together," resulting in local areas of poor supply.

Reinforcement of such areas is difficult especially now with the shortage of pipe materials. In some of these cases an automatic governor loader should be of advantage. It has been our practice to install loaders in district governors in sections where large house heating loads are developing.

Pressure Range

As a result of quite extensive experiments made in the use of natural gas, we have found that a pressure range of 3″ at consumers' appliances can be tolerated, although some complaints were received. A range of 4″ resulted in numerous complaints with almost all of the complaints coming from areas of low pressure. We isolated a section of the system containing approximately 6,500 customers and deliberately raised and lowered pressures throughout this district. We found that the customer complaint situation became serious above 8″ and below 4.5″, showing that a pressure range of 3.5″ was tolerable with correct burner adjustment. In the interest of good service we attempt to limit the pressure range on any service to 2″, but do not always succeed.

In a distribution system a pressure drop of only 2″ between high and low points would, of course, seriously limit the capacity of the system to deliver gas. We are confronted with two problems (1) as an essential to good customer service to maintain a small pressure range on consumer appliances and (2) from a distribution capacity standpoint to allow as large a pressure drop as possible. The automatic loader helps to solve this problem. It would operate satisfactorily in a system supplied by only one governor. If an off-peak pressure of 6.5″ is maintained at the outlet of a district governor and this pressure is increased to 8″ during peak hours pressure range near the governor on the consumers' appliances would be 1.5″. At the low point in the system, pressures would vary from approximately 6.5″ off-peak to 4.5″ at peak hour, or a range of approximately 2″. However, distribution pressure drops during peak hour would be from 8″ to 4.5″, or 3.5″. The capacity of a system is 33% greater with 3.5″ pressure drop than with 2″.

Our experience with loaders has been limited to that type which depends upon the velocity of the gas for its functioning. This is the type employing the well known principle of the venturi tube.

A brief discussion of what we call a "typical square mile of a low pressure gas distribution system," together with a description of our system as a whole, will make the discussion of our experience with automatic loaders more intelligible.

Low Pressure System

In designing our low pressure cast iron distribution system, we have adhered as closely as possible to certain standard specifications which have been set up from studies of the typical square mile of gas supply.

Briefly, this typical square mile consists of 17 residential streets on which are 4″ cast iron lateral mains, fed by a 12″ header running at right angles to the lateral mains. A 12″ district governor feeds the 12″ header, as shown in Case 1. It is assumed, of course, that the high pressure transmission mains, necessary to supply the district governors, have been run.

The total number of services in a saturated square mile is estimated at 3,600. This figure was built up from actual count of lots in a typical square mile. The ratio of consumer to service in our system is 1.2, giving 4,320 consumers per square mile, saturated, which at 12 cu. ft. per hour per consumer would give a peak hour consumption per square mile of about 52,000 cu. ft. for domestic and water heating, but with no house heating load. However, the square mile, is in itself, rarely ever entirely built up solidly, and the demand, including some commercial load, might be around 50,000 cu. ft. per hour of 1,000 Btu. gas.

A statement of main materials, hourly capacity and progressive reinforcement of this square mile, assuming a uniform loading when distributing a 0.70 gravity gas, follows:

Case 1. Pressure range—65/10ths to 45/10ths.
Capacity—90,000 cu. ft.
Materials—
5,280′—12″ cast iron main
89,760′— 4″ cast iron main
1 —12″ governor

Case 2. Adding a loading device
Pressure range—80/10ths to 45/10ths.
Capacity—120,000 cu. ft.
Materials—(In addition to 1.)
1—Loading device

Case 3. Feeding the 12″ header at one-half mile intervals.
Pressure range same as 2.
Capacity—162,000 cu. ft.
Materials—(In addition to 2.)
2,640′—8″ main
1 —Governor and loading device

Case 4. Reinforcing the 4″ lateral at one-half mile intervals.
Pressure range same as 3.
Capacity—340,000 cu. ft.
Materials—(In addition to 3.)
5,280′—12″ main
1 —12″ governor and loading device

Presented at American Gas Association, Technical Section, Distribution & Motor Vehicle Conferences, Chicago, Ill., April 15, 16, 17, 1946.

Case 5. Reinforcing the one-half mile headers at one-half mile intervals.

Pressure range same as 4.

Capacity—435,000 cu. ft.

Materials—(In addition to 4.)
2,640'— 8" cast iron main
1 —12" governor and loading device

Based upon average input of house heating units in Detroit of 126 cu. ft. per hour, and using 90% diversity for the square mile, Case #5 would provide capacity for 75% house heating saturation.

In Detroit the main highways are located at mile intervals and form a perfect gridiron. As a general rule, the 12" headers are placed in the east and west streets and the laterals in the north and south streets.

New Areas

In addition to the older, built up sections, we have close to 75 square miles which are in various stages of development, some up to 75% saturated and others not so well developed, but where building activity will start soon. In all of these, we are adhering as closely as possible to our specifications as set up in the typical square mile. The 12" headers vary in length from one continuous header 15 miles long to short ones. The older sections were designed for 530 Btu. gas, but considerable additional capacity was realized in these areas when we started using 1000 Btu. gas.

We have found considerable "bunching" of the house heating units on certain lateral mains and Case #3 (feeding the headers at half-mile intervals) is not as important as Case #4 (feeding the laterals by running 12" headers at half-mile intervals). We have several miles of this type of reinforcement.

Typical Loads

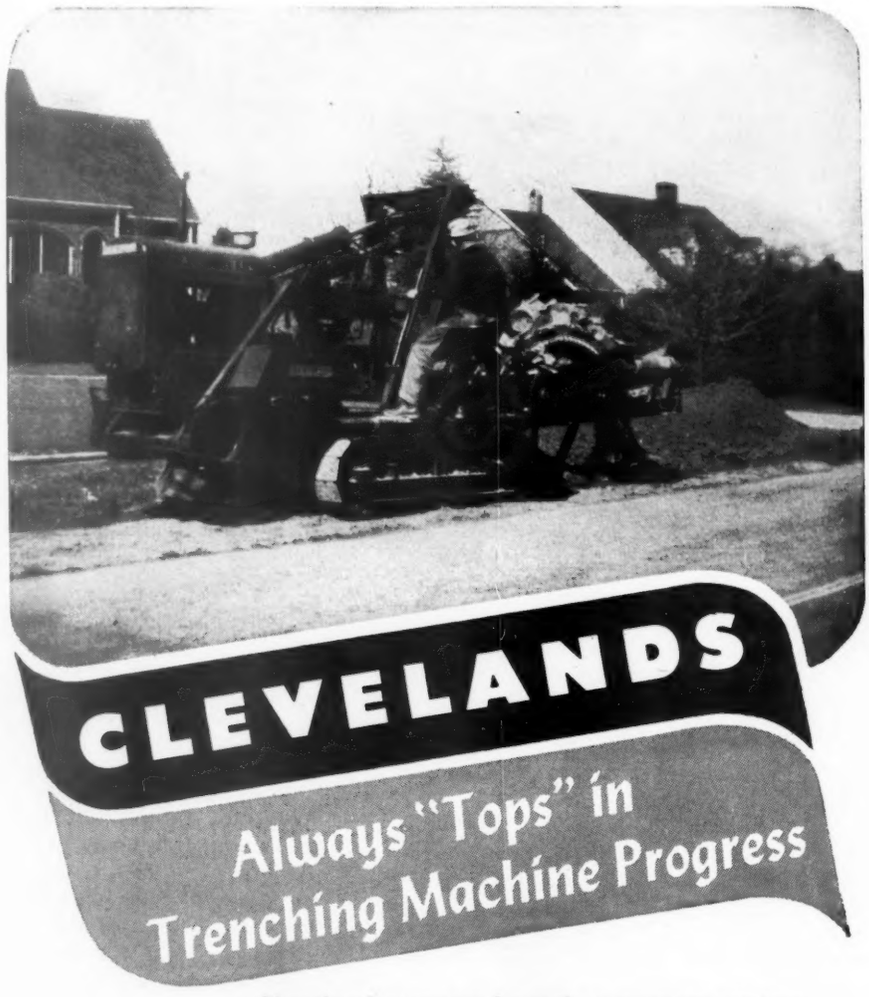
The square mile containing the greatest house heating load now has 3,800 consumers and 1,500 house heating units installed, with an average input of 166 cu. ft. per hour, or a peak hour demand on maximum days of 225,000 cu. ft. house heating and 45,000 cu. ft. domestic, or a total of 270,000 cu. ft. For peak hour house heating, we use a diversity of 80% for the system as a whole, 90% for a square mile and no diversity for laterals having a one way feed.

The average house heating load per unit for the system as a whole is 126 cu. ft. per hour, or a system demand of approximately 100 cu. ft. per hour per house heating unit. We now have 60,000 house heating units on our lines, resulting in a house heating load of 6,000,000 cu. ft. at peak hour.

The maximum hour of the house heating load occurs between 8 A.M. to 9 A.M., and is equal to 5.8% of the 24 hour load, the minimum hour occurs between 11 A.M. to 12 midnight and is 2.7% of the 24 hour load. We have developed hourly percentage curves of the maximum day for House Heating, Industrial, Residential and Commercial loads on maximum days, and find these curves of extreme importance in developing our high pressure transmission main system.

Industrial Peaks

The Residential and Commercial load dovetails nicely with the House Heating load. However, we find the Industrial peaks occur during House Heating peaks. As practically all of the Industrial load is taken directly from the high pressure transmission mains, the load on the low pressure system is not affected. Each house



Cleveland pioneered nearly a quarter century ago, the compact full-crawler mounted digging wheel. Cleveland's continued alertness to customers' requirements plus an aggressive open-minded engineering has contributed such other "firsts" as — transmission controlled speed changes and speed combinations, equalized drive to the digging wheel through enclosed differential, trailer mobility, unit-type construction minimizing repair time — most complete utilization of anti-friction bearings, welded construction of quality materials. THIS IS YOUR GUARANTEE THAT WITH CLEVELANDS ON YOUR JOBS YOU WILL GET "MORE TRENCH IN MORE PLACES AT LESS COST."

THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

heating job is spotted on a distribution map, showing by symbols three ranges of input, up to 150 cu. ft. per hour, 150 to 300 cu. ft. per hour and over 300 cu. ft. per hour.

Regulation

Back in 1928 we started experimenting with a loader which repended upon the velocity of gas through a venturi tube placed in the main at the outlet of the regulator for pressure boost. These venturi tubes were made in various shapes and sizes. The float line of the regulator was connected at a point just beyond the throat of the venturi.

However, difficulty was experienced in controlling the boost. Pressure would continue to build until the regulator was wide open. This condition was remedied by placing a ¾" service regulator in the float line close to the venturi throat. A connection was then made from the float line at a point between the service regulator and the main regulator directly to the outlet of the main regulator. A needle valve was placed in this connection to permit a small flow of gas through the service regulator to the venturi throat. The service regulator was set to close at 8.0" and pressure at the outlet of the main regulator would remain constant at 8.0:, limiting the boost to this pressure.

For simplicity and ease of installation the orifice plate was substituted for the long venturi tube. The plate did not give the gradual increase in pressure that the venturi tube gave but it functioned in a satisfactory manner.

Considerable improvement has been made in the mechanical parts of the loader since the first models were developed. The company making them has now developed a loader using the orifice plate and a small venturi connected directly to the float line and placed in the center of the orifice plate. As the pressure difference developed follows the law of the square of the velocity of the gas passing through the plate the proper size of the plate orifice is very important. If too small the regulator will load continuously, and if too large difficulty will be experienced in obtaining any boost. Due to rapidly increasing loads some of our governors are equipped with loaders having orifices in the plates which are too small and will have to be replaced.

A loader should be so constructed that the orifice plate is readily and easily interchangeable so that various size orifices can be tried out. This is especially important where large house heating loads are rapidly developing.

Our experience with loaders to date has not been wholly satisfactory. On dead-end systems supplied by one governor or on systems loosely connected we have had excellent results. However, on systems where a group of governors feed into a common 12" header, one or two of the governors will "hog" the load at off-peak hours shutting off others entirely. Such a condition is not serious from the customers' viewpoint but is undesirable from the viewpoint of reduced takes from certain transmission mains. The over-all advantage has been an adequate supply of gas at the points and time required. Our principal difficulty is not in making them load but in making them unload at off-peak hours.

Governors equipped with loaders maintain a constant outlet pressure under all conditions of load. The ordinary weight type of governor, not equipped with a loader and adjusted to a certain pressure at off-peak hours, will drop the outlet pressure from 0.5" to 1.0" at times of heavy demand due to the increased effective area of the main regulator diaphragm when the regulator approaches the wide open position. This is also true, but to a lesser extent, when the inlet pressures are low. This is a very important point and we feel justified in installing loaders if only for this reason.

Adjustments

The adjustment on some of the loaders is quite critical. This, however, may not be the fault of the loader. The orifice plate may not be of the correct size. In making up the specifications for a particular loader, it is very difficult to estimate the maximum load conditions. The orifice plate should be as easily removable as is the plate in an orifice meter. It then becomes a simple matter to select one of correct size.

To summarize, we find that:

(1) In systems fed by one governor, automatic loaders operate satisfactorily.

(2) They hold a constant governor outlet pressure under all load conditions.

(3) Where all governors in a closely connected system are equipped with loaders, certain ones will "hog" the load at off-peak hours.

(4) Adjustment in some cases is critical.

(5) Proper size plate orifice is essential.

(6) Plates should be easily changed.

We plan to do some further experimenting this year with various size orifice plates and also attempt to solve the off-peak hour problems of making the loaders unload at the proper time. An automatic valve placed in a header at the center point between two unloading governors feeding this governor might solve the problem. This valve, or regulator, would be set to close at 7" and so connected that if pressure in the 12" header on either side of the closed regulator should drop the regulator would open. These and other experiments will be attempted this year, and probably by the time the heavier loads of next winter come we will have some of the answers.

SUPERIOR GAS METERS

For Sound Values and Continuous Operating Economy

Meters for Domestic and Industrial Use. All Sizes 5B to 60C.
Wet Test and Demonstration Meters — Diaphragms —
Service Cleaners — Provers — Meter Repairs

Write for details and quotations

SUPERIOR METER COMPANY, INC.

167 41st Street ***Brooklyn, N. Y.***

You take no chances

with

UNIVERSAL GAS RANGE

YESTERDAY—TODAY—
TOMORROW—THE LEADER:
UNIVERSAL GAS RANGES!

For three generations Universal Gas Ranges have been the standard of perfection. And today Universal offers the most dependable, satisfactory and attractive line of gas ranges in history.

With millions of homes, old and new, to be equipped with new gas ranges, it is important that you present to this new market a range of Universal's proven quality.

CRIBBEN & SEXTON
UNIVERSAL *Gas* RANGE
700 N. SACRAMENTO BLVD. CHICAGO 12, ILLINOIS

Detroit Method of Sales Training

The What, How and Why of Salesmen, in the Domestic Appliance Sales Division of Michigan Consolidated Gas Company, Detroit District

By
M. W. Bowman

THIS is the story of the sales policy, domestic appliances, as well as of the manner in which Detroit District of Michigan Consolidated Gas Company takes an embryo salesman and transforms him into a finished product as related to American Gas Journal by N. E. Loomis, Sales manager of the domestic appliance sales division.

Both this sales policy and method of training and supervising salesmen have been dictated by experience as being the most profitable, the most conveniently administered and the most congenial to local sales conditions. These are all factors which control the recruiting of the potential salesman, his training, his supervision and his mode of operation.

Despite the size of this company no numerically great sales force is maintained. There are a number of reasons for this. First, the sale of appliances as such is a secondary aim; the primary aim being the sale of gas as a fuel with appliances acting wholly in the role of consumer for this fuel. Second, such calls as the sales force make in the domestic field are the result of direct leads which means a concentration of effort and permits the size of the sales force to be directly proportioned in ratio to the number of such leads coming in and to the amount of work the individual salesman can reasonably be expected to successfully accomplish.

There is no such thing as "cold" canvass by the company salesmen. The non-existence of this method of making appliance sales can be directly attributed to the excellent and mutually cooperative understanding that exists between the company and the thousands of retail outlets for these appliances that dot greater Detroit.

As long as these retail outlets show a sufficient volume of appliance sales the company is quite willing to let them make such sales and discourages any effort to cut in on this type of business. Cold canvassing on the part of the company, they are sure, would only alienate the interest and cooperation of these dealers throughout the city with a subsequent loss of business that could scarcely be replaced regardless of any company action that could be undertaken economically.

Long years of careful analysis of the sales potential and a close and constant scrutiny of new building and construction allow the company to very accurately estimate the gas appliance sales that should result in any given period. Of course, should sales fall off, for some reason or another, below the expectant level the company will then increase the size of their own staff and go out after appliance sales in volume.

This very satisfactory sales plan of dealer-company cooperation bears another dividend, in the matter of selecting salesmen. They have time to pick and develop the cream of the crop, concentrating their effort to the best men obtainable, and thereby building up an unusually competent, loyal and technically knowledgeable staff.

Source of Recruits

As a rule Michigan Consolidated obtains sales recruits from two sources; from the young men working on New Main and Service contracts and from amongst clerks who type orders in the office, make out Plumber's contracts and thus gain some knowledge of equipment and installation problems. Another, less fertile source of supply, is from among the friends of salesmen already in company employ. But in all cases it can be seen that before the embryo salesman goes into training he is more than usually well qualified by the company.

Young men will take out the new service and main contracts which the company has drawn up from their study of the building permits. They will either get these signed after a personal interview with the builder or they will leave them with the man's secretary. In any event the potential salesman absorbs selling atmosphere and gains knowledge and interest in the gas business from this day by day activity.

N. E. LOOMIS
Merchandise Sales Mgr.
Mich. Consolidated Gas Co.
Detroit, Mich.

The next step forward is promotion to an outside salesman. This is a cooperative action involving both company and potential salesman. The company explains the greater opportunities that lie ahead in the selling field, the candidate prepares to meet the strict requirements. He is given a quasi-psychological test, and the Servel Questionnaire. If he passes this test which automatically furnishes some rating of the candidate's qualifications well and good. If he does not the company is not necessarily uninterested in him as a salesman. The test is regarded by them rather as a lead towards discovering necessary qualifications rather than the final arbiter. Once the embryo has passed the primary tests he is given a salary and commission in lieu of his former straight salary and his training as a salesman commences.

Michigan Consolidated choose many of their salesmen from the clerical ranks. Usually all potential salesmen are young men, from eighteen to twenty three or four, preferably, but not necessarily with a High School education; neat appearing, a ready smile and a nice approach. The

company watches and listens to these young men as they go about their work and talk over the telephone. As with many individuals they soon exhibit a liking for salesmanship if such liking be within them. Once they have demonstrated in this ubiquitous fashion their salesman-like tendencies the company may extend the invitation to them to become salesmen.

Training Methods

This method of recruiting salesmen from these several fields has worked most successfully for the company. Fully 75% of such salesmen so chosen prove adequate to the job. It makes no difference from what cross-section of the public the young man comes from as long as they can meet the rigid requirements of the company and successfully pass the day by day inspection they come under as they work as clerks or in any other capacity.

Nor does the company emphasize the desirability of previous selling experience. They would just as soon or rather take an absolutely green man in preference to a man with a dubious selling experience gained in some other line of business. Once the salesman is chosen he goes through a course of indoctrination and is channeled through the regular AGA sales course. The men sell each other in these classes, overcoming any tendency to group shyness and always open to correction of faults from supervisors who tutor these sessions and watch the development of their pupils. Sound slides, trips through gas appliance manufacturing factories; trips with service men on calls in the field; oral and written examinations comprise the initial steps taken and form the basic background of the man who is being made into a salesman.

Morning Meetings

While these are the initial steps training never ceases. It's a year round function of the company who believes that no man can ever know too much about his job or that too many answers can be found to questions customers might ask. The Sales staff reports at eight in the morning and goes into a short meeting where every conceivable subject and any conceivable subject related to the gas business and the selling of gas appliances may be brought up. The responsibility of having something pertinent and timely to talk about in these sessions lies upon the shoulders of the sales supervisors. Talks may deal with approaches, closing, the proper continuity of the sales talk; anything at all. At this time too, salesmen make out their call routes; turn in a duplicate call route to the supervisor and turn in any cash they may have collected.

Outside company salesmen work in crews under a supervisor. By a method of trial and error through the years the company has settled upon seven men and the supervisor as forming the crew of ideal size. On the average the salesman, who necessarily drives his own car and provides for it, arranges to cover fifteen calls.

Supervisor Helps

During the day it is the duty of the supervisor to check on the progress of his salesmen. He will call on a home which his list tells him is also on the salesman's list. He may call after or at the time the salesman is calling, or has called. A little skillful questioning and he knows what kind of an impression his salesman has made on this customer. If the impression is good that is fine. If the impression is bad the supervisor learns why. Such faults as he may come across regarding his salesmen is noted and is made a matter of a personal talk or a matter of group discussion at the next morning meeting. These regularly scheduled calls and the supervisor's system of checking up work to the salesman's benefit in two ways. If he has had a few tough calls and feels like quitting, he can't very well because here is the supervisor on his trail. If he makes a sale, no stopping off for celebrations; the other calls can't be neglected. The company benefits because they are getting a steadily applied pressure towards sales objectives.

Supervisors' duties include closing sales for salesmen when needed. All salesmen work on a definite quota. Occasionally trouble besets the salesman. He isn't making his quota. In such cases the supervisor travels along with the salesman to find out why. At times the supervisors have allowed the salesman in question to bumble right through his whole sales talk and close even though it may mean that the customer is lost forever, because of the salesman's weakness. But the company feels that a single sale is not as important to them as to find out what the trouble is with their salesman. In the long run the wisdom of this procedure cannot be doubted. Once the salesman is corrected and guided back to the right road his sales mount. More important, he ceases killing what should be sales.

Source of Leads

Sales leads come into the company in numbers ranging from 25 to 30 thousand annually and come from their own employees. These leads may generate anywhere and from any division of the company. These leads are noted, passed into the sales department and distributed to salesmen according to the territory they are assigned to. This means that no salesman is making a cold call. Rather, he has an entree and this may account for the high percentage of sales per call resulting to Michigan Consolidated. Salesmen making these calls are expected to qualify the customer and report on them, using a regular form, to the sales office. They either report the "No Sale," or "likely."

If it is a likely prospect the salesman may call on them three or four times. But if no sale results in this time the slip on the customer is sent back to the employee handing in the tip the first time. The company does not encourage too many calls nor too much wastage of time. If the salesman reports unfavorably on the customer after his first call he is not allowed to waste any more time there. If he has reported "No Sale" and the customer walks into one of the company's branches the next day and buys, the commission goes to the salesman working on the floor and actually making the sale. No territory is protected for the salesman at any time. Such grief and misunderstanding as might arise from this situation is compensated for by the fact that the company allows him both commission and salary. They expect and it is so understood by the salesman that his salary covers disappointments arising in such contingencies.

As a rule sales tips coming from the employee are held for 30 days and worked before being sent back to the employee sending in the tip.

After making a sale one of the salesman's duties is to call back on the customer, express thanks for the business and find out if operation and installation of the equipment is satisfactory. This is a courtesy that has brought much business to the company in greater Detroit.

Sales Approach

A canned sales talk forms the basis of the salesman's selling effort. Much debate has ensued in selling circles on the merits or non-merits

of the canned talk. But Michigan Consolidated feel that the substantial and seldom forgotten canned talk gets a salesman out of many a hole when otherwise the sales might be lost. No parrot-like repetition of the talk is asked for by the company nor even wanted. They expect their salesmen to embody the meat of the canned talk into a talk of their own creation and thereby rendered suitable to the salesman's own peculiar personality.

At all costs the salesman is warned against quoting price until he has given the body of his talk and explained why his price is what it is. All refrigerators are white, are shiny, are made of steel and look nice inside with all their food compartments. What the Michigan Consolidated salesman is asked to get over is why this brightness, this shine, this gas-fired unit, is worth more than some other unit down the street that may look just as nice. There is no surer way leading to argument and lost sales than a hasty quotation of price, in the opinion of this company.

Full time salesmen on the floors of one of the nine sales offices throughout Detroit graduate from the outside sales ranks. These are the men who have withstood the trials and tribulations of field selling. These are the proven closers; the cream of the crop. Years of field selling has given them sure judgment of character and they know all the answers.

There is just one final word. Many of the domestic appliance salesmen in Michigan Consolidated Gas Company know how to bake a cake or a pie. They learned how from the Home Economics department maintained by the Company. This is something the housewife customer of the company can appreciate and does. It helps making sales many, many times.

92.8%
Let Public Preference
Nearly 93 out of every 100 city homes in California use GAS for cooking.
Be Your Guide
Gas for cooking, on the ascendancy for years, zoomed to new heights of popularity following the introduction of modern, attractively-designed gas ranges with automatic controls. "CP" minimum standards, constant technical improvements, popular new features—all have contributed to the ever-increasing demand. * Now a vast *new* market is unfolding, and you can best take advantage of it by displaying and recommending the appliances that home-makers *like* and *prefer*. * Remember, 92.8 per cent—nearly 93 out of 100 city homes in California cook with GAS. Let this overwhelming preference be your guide.
THE PACIFIC COAST GAS ASSOCIATION
THE WEST PREFERS
GAS
QUICK • CLEAN • DEPENDABLE
FLEXIBLE • ECONOMICAL

93% USE GAS FOR COOKING

This advertisement, original size 7" x 10" is part of a series used by Pacific Coast Gas Association in appliance publications of the Pacific Coast. Prepared by Knollin Advertising Agency.

CRUSE-KEMPER COMPANY
AMBLER, PENNA.
GAS HOLDERS
Low Pressure High Pressure Inspection
Purifiers Tanks Flues
Over 40 Years of Sound
Steel Plate Construction

FOR ALL THAT'S NEW—
Look To The Line of The Leader!

It stands to reason that the biggest selling line must be offering the biggest values. And *Garland is!* More of everything that counts in volume cooking! Plenty of speed, convenience, flexibility, efficiency and economy. Because Garland Restaurant Ranges are designed and engineered by men who understand today's needs. Let your Garland Food Service Equipment Dealer show you, or write us direct.

LEADER IN COMMERCIAL GAS COOKING EQUIPMENT

Garland Restaurant Range No. 83

Garland Restaurant Range No. 82

Garland Restaurant Range No. 84

Garland Restaurant Range No. 86

GARLAND

THE TREND IS TO GAS FOR ALL COMMERCIAL COOKING

A Product of Detroit-Michigan Stove Co. · Detroit 31, Michigan

Toledo Conference Huge Success

THE A.G.A. Sales Conference on Industrial and Commercial Gas sponsored by the Industrial and Commercial Gas Section, American Gas Association, was held at the Commodore Perry Hotel, Toledo, Ohio, March 29 and 30. A new high in enthusiasm and interest was recorded by the 250 delegates from 21 states, Canada and the District of Columbia.

Chairman Harry A. Sutton of the Industrial and Commercial Gas Section opened the sessions and was presiding officer on Friday and Saturday mornings. Karl Emmerling, Vice Chairman of the section presided at the Friday afternoon session.

The recent custom of presenting the Section's immediate past chairman with a gavel of which there has only been one other recipient, Mr. Charles G. Young, Springfield Gas Light Company, before Mr. Harry K. Wrench, Minneapolis Gas Light Company received his from Chairman Sutton at this Conference, was heretofore the only award ever made for service in the Industrial and Commercial Gas Section. This Conference inaugurated the awards for contribution to the industry through service in the activities of the Section in the form of certificates of life membership in the Industrial and Commercial Hall of Flame which was a mark of recognition and a tribute well appreciated and destined to grow in value to those loyal workers who were so rewarded.

The first general session was opened by Mr. Sutton whose remarks "As I See the Industrial and Commercial Gas Picture" sounded the keynote for the two-day Conference. He briefly summarized the problems confronting the industry today and in the near future. Going back over the war years in the gas industry, Mr. Sutton reminded us of the many war developed processes that will be adapted to present day production, and that those attending the Conference would be apprised of the tools at hand to meet those problems in the many papers that would be presented. Among those "tools" would be, prepared atmospheres, highspeed direct gas heating, high temperature radiant heating, the opportunities for building commercial gas loads and many others of special interest to industrial gas engineers and commercial gas salesmen.

Growing Use of Prepared Atmospheres

E. G. de Coriolis, Director of Research, Surface Combustion Corp., Toledo, presented the first paper entitled "The Growing Use and Sales Importance of Prepared Atmospheres." As evidence of the now widespread use of prepared atmospheres he stated that their use had increased by leaps and bounds especially during the war years to tens of millions of cubic feet per day. During this increased use both the quality and chemical constituents had been improved resulting in increased production rates and effectiveness of control.

Building Load with Water Heaters and Steam Boilers

Swinging to the commercial aspects of the gas business, O. M. Olsen of the Sellers Engineering Company, Chicago, presented a paper on "Water Heaters and Steam Boilers-Load Builders for Commercial Gas" which was an inspiration to all commercial gas men. He pointed out that there was a golden opportunity to promote this gas load now as a result of an "equipment void" during the past five years. Mr. Olsen stressed the need of training specialized salesmen in the water heater and steam boiler field as it would be a big job to cover apartment buildings, hotels, restaurants, lunch counters, beauty parlors and a host of other applications.

J. P. Leinroth, Chairman of the National Advertising Committee of the Industrial and Commercial Gas Section reviewed the present Section Advertising program wherein A.G.A. advertisements were appearing in 26 trade publications covering 16 fields and in addition 37 college technical publications had been added to the program this year. Mr. Leinroth stated the importance of the continuing cooperation of industrial and commercial gas men in securing good case history material for use in our advertising. He also stated that the entire campaign was not based on case histories alone, but many of the advertisements were featuring a series of specific advantages of gas, such as controllability, speed, economy, flexibility, etc.

Schools are the Largest Single Purchasers of Food

Millions of school children eat one meal a day at school, and "The Cooking Problem Involved in the Expanding Public School Feeding Program" was most interestingly told to the conference delegates by Miss Margaret Crozier, Manager, School Cafeterias, Board of Education, Philadelphia. Miss Crozier outlined her organization set up in the purchasing, preparation and serving of food, administration and the facilities necessary for adequate serving and comfort of children.

Harry A. Sutton (left) Chairman, Industrial and Commercial Gas Section presenting traditional gavel to Harry K. Wrench, Pres. and General Manager, Minneapolis Gas Light Co., Immediate Past Chairman.

Broader Opportunities On The Sales Horizon

Franklin T. Rainey, General Sales Manager of The Ohio Fuel Gas Company, Toledo, gave a paper on the potential sales possibilities in the future. "Due to our continually changing economic conditions, it is vitally important that the industrial and commercial gas salesmen keep abreast of these changing conditions to grasp opportunities as they present themselves and be prepared to meet

ever present competition," Mr. Rainey stated. He continued by stating the factors that will give the individual the opportunity of improving himself to meet conditions that will confront him in his quest for new business. His concluding thought was that there will be many changes and readjustments in the industrial and commercial markets, and to meet competition, we must be keener than ever before to face this situation.

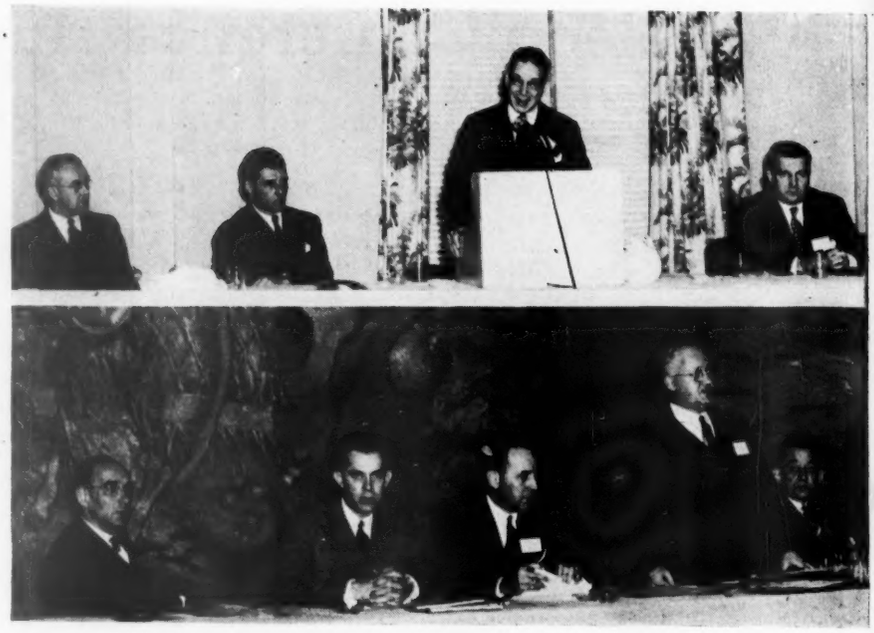
More About Building Commercial Sales

Making effective use of charts and slides, Leon Ourusoff, Chairman of the Food Service Equipment Committee, gave his views on "Building Prestige and Sales in the Commercial Market." As Manager of Utilization, Washington Gas Light Co., he presented step by step how his company is doing this job.

A bright spot in the two day session was a short presentation on "What's doin' In Industrial Gas and Commercial Gas." Four men gave their views on this subject covering North, East, West and South, making N-E-W-S. For the North, Allen M. Thurston, The East Ohio Gas Company, Cleveland, told of the conditions and accomplishments in that area. John Huston, The Bridgeport Gas Light Co., came from the East to present his picture of industrial and commercial gas in that territory. Then the West was represented by R. D. MacMahon, Southern California Gas Co., who gave a vivid portrayal of how business was conducted on the coast with special reference to greater competition out there. And lastly, D. D. Beach, Atlanta Gas Light Co., spoke for the South, and his views on that section of the country were of great interest to the entire audience.

Panel Sessions

On Saturday afternoon, concurrent panel sessions were held, one on Industrial Gas led by Karl Emmerling, Vice Chairman, Industrial and Commercial Gas Section, and one on Commercial Gas under the leadership of Leon Ourusoff, Chairman, Food Service Equipment Committee, A.G.A. Five papers were presented at the industrial panel session with a discussion period after each one. In a highly technical paper, Carl H. Lekberg, Northern Indiana Public Service Co., Hammond, Ind., spoke on "Interruptible Quenching." This paper appeared in the April issue of the *Journal*.



Above: Commercial Panel Session. L. to R., Paul W. Craig, Equitable Gas Co. Pittsburgh, Leon Ourusoff, Washington Gas Light Co., presiding. C. W. Roll, The Brooklyn Union Gas Co., J. A. Rockefeller, Public Service Electric & Gas Co., Newark, N. J.

Below: Industrial Panel Session. L. to R., Otto Lutherer, The North American Manufacturing Co., Cleveland, K. W. Stookey, The Gas Machinery Co., Toledo, C. H. Lekberg, Northern Indiana Public Service Co., Hammond, Indiana, Karl Emmerling, The East Ohio Gas Co., Cleveland, presiding.

"Heating by Immersion and Submerged Combustion" was the title of a paper by Charles C. Eeles, The Ohio Fuel Gas Company, Toledo.

In line with a previous paper on controlled atmospheres, K. W. Stookey, The Gas Machinery Co., Cleveland, presented a paper on radiant heating entitled, "Indirect Heating Moves Up Into the High Temperature Bracket."

"Where Do Gas-Oil Burners Fit In?" was the next paper presented for discussion by Otto Lutherer, Chief Engineer, The North American Manufacturing Company, Cleveland.

Commercial Gas

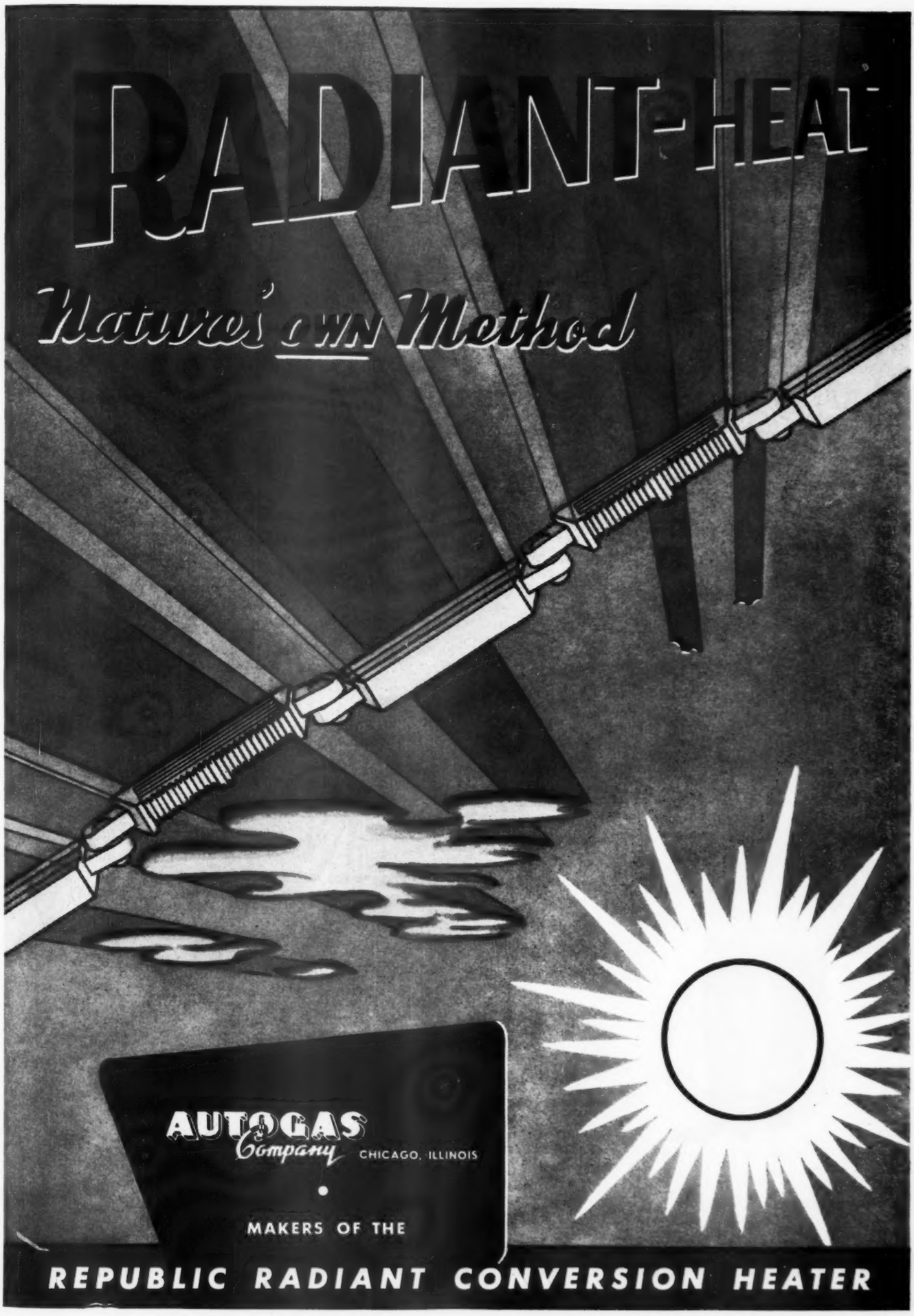
Equally well attended was the Commercial Gas Panel Session where four topnotch papers were presented that were an inspiration to the commercial gas men present. Under the able leadership of Leon Ourusoff, Chairman of the Food Service Equipment Committee the members of the panel gave their papers and conducted spirited discussion periods.

Leading off this session, Carlton W. Roll, The Brooklyn Union Gas Company, propounded the question, "Are Your Retail Bakeshops Gas-Fired?" With the increased demand by the public for baked goods, and the competition faced by the retail baker, Mr. Roll pointed out that the gas-fired shop was the answer to one of the bakers' many problems of operating at a profit.

Another opportunity to develop additional gas load is "The Church Kitchen as a Market for Gas," presented by P. W. Craig, Equitable Gas Company, Pittsburgh. In a great many instances, Mr. Craig pointed out, the gas-fired equipment was obsolete and in poor condition; that an educational campaign is in order to acquaint churches of the economy of having their kitchens placed in an up-to-date efficient condition to carry out their programs.

While not very large in comparison to other commercial gas loads, Harry B. Wilson, The Brooklyn Union Gas Company, said that "We Must Get the Small Tailor Boiler Load." It is generally agreed that the automatic gas-fired steam boiler

(Concluded on page 68)


RADIANT-HEAT
Nature's own Method
AUTOGAS Company
CHICAGO, ILLINOIS
MAKERS OF THE
REPUBLIC RADIANT CONVERSION HEATER

Worth Waiting For...

REMEMBER THIS
MARK OF QUALITY

A HUMPHREY H PRODUCT

Although our factory daily is producing more and more fine Humphrey appliances, still there are not enough available to meet the immediate needs of everyone. We are making every effort to satisfy the great demand for these high quality Humphrey products — products of distinction which are well worth waiting for.

GENERAL GAS LIGHT COMPANY · KALAMAZOO, MICHIGAN

23 WARREN ST., NEW YORK CITY 2nd UNIT SANTA FE BLDG., DALLAS 225 ELEVENTH ST., SAN FRANCISCO

Large Volume Water Heating

A series of articles for the Engineer, the Architect, the Salesman and the Contractor.

They show how to select and install correct types of Water Heater Systems for specific purposes.

By

Malcolm B. Mackay

The Burkay Company

CHAPTER IV

Part 2

Steam Heated Booster Water Heaters

REFERENCE to the piping diagram of a typical method employed for mixing live steam and 140° F., water to produce 180° F., water to supply the final rinse water demand of a spray type dishwasher, as shown in Figure 4, will serve to better visualize not only the possibility of a wide fluctuation in the temperature of the boosted, or super heated water delivered at point "X" but other operating and maintenance problems which will result from this method of heating water.

In the piping diagram, Figure 4, steam and 140° F., water are mixed to theoretically provide 180° F., water at point "X."

Regulating valves, "G" and "H," are intended to balance or proportion the flow of water and steam while check valves, "A" and "B," are presumed to prevent water flowing back to the steam boiler or steam escaping to the 140° water line as a result of unbalanced water and steam pressure.

Branch supply lines carrying 140° water to various fixtures are connected to the 140° water line.

Various factors which will either interfere with proper or satisfactory operation, or which may result in serious trouble may be visualized as follows:

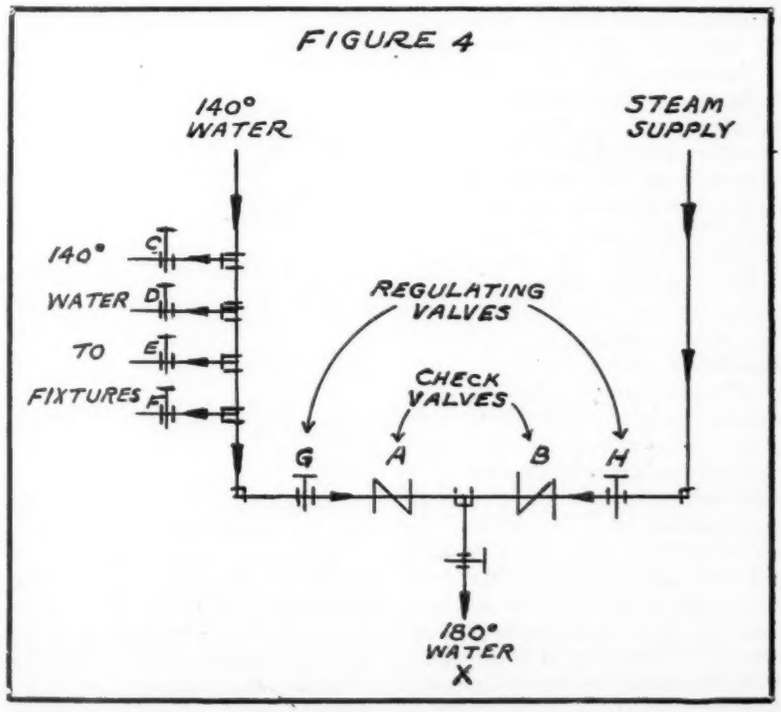
In the event of failure of check valve, "B," to seat tightly, as an inevitable result of scaling or pitting of the valve seat, the excess of water pressure over steam pressure will permit raw water to flow back to the steam boiler. This uncontrolled addition of raw water to the boiler could be in sufficient volume to not only disturb the boiler water treatment process, but also to require the boiler to be blown down with unnecessary frequency causing unnecessary waste of boiler water conditioning chemicals and possible, ultimate damage to the steam boiler due to inadequacy of water treatment.

Conversely, should check valve, "A," fail to seat properly and the water be shut-off from the 140° line, or, should water pressure drop below the pressure of the steam, a hazardous condition would exist due to the possibility of steam or excessively hot water being discharged at hot water outlets or fixtures.

Were the 140° water and steam regulating valves "G" and "H," to be adjusted to obtain 180° water at point "X" during an off-peak period when *no* hot water demand from fixtures supplied by branch hot water supply lines existed, the temperature of the water delivered at point "X" would rise sharply—possibly to the extent that it would flash into steam—were the hot water outlets of fixtures, represented by valves "C," "D," "E" and "F" to be opened simultaneously causing the flow pressure in the 140° F., supply line to *drop* considerably below that which existed at the time regulating valves, "G" and "H," were adjusted to obtain 180° water at point "X."

Conversely, were the steam pressure to *drop* below that which existed at the time regulating valves "G" and "H" were originally adjusted, the temperature of the water delivered at point "X" would *drop* far below the anticipated 180° F.

FIGURE 4



Heating Water by Direct Steam Injection.

The frequently employed method of heating water by means of the direct injection of steam through a pipe immersed in the water in a sink or other open vessel should also be avoided if for no other reason than the following:

It is inefficient and will seriously disturb the effectiveness of the steam boiler, water treatment process as described in the foregoing paragraph.

Were the boiler steam pressure to *drop* abruptly, there is a strong possibility that soap or grease laden water from the sink, in which the steam pipe or jet is immersed, would be drawn into the boiler by the resulting syphon action to completely nullify the action of the boiler water chemicals and, in all probability, require a complete shut-down and flushing of the boiler to remove the greasy or soapy film from the inner surfaces. This could occur even though a check valve were installed in the steam supply line to the immersion jet or pipe if scaling or pitting of the check valve seat prevented tight closing.

Were the shut-off valve in the steam supply line, close to the boiler, to be *closed*, the negative pressure resulting from condensation in the steam line could cause a not inconsiderable volume of soap or grease laden water from the sink to be drawn into the steam supply line and, ultimately, into the steam boiler with equally serious effect. An immersion steam jet in a sink or other open vessel requires approximately 37 pounds of steam *per hour* — slightly over 1 boiler horsepower—to heat and maintain approximately 25 gallons of water at 130° F. If the boiler is already carrying its rated load, other steam heated equipment will fail to secure an adequate supply of steam.

Two Temperature Water Heating Systems

(1) General.

(a) Where hot water, at *two different temperatures* is required—at *normal* hot water temperature for general use and at an *excessively* high temperature to supply a specific demand — a water heating system which *combines* the functions of a recovery system and a booster water heater and yet requires only a *single* water heating unit and a *single* hot water storage tank may be employed.

(b) As the water heating unit must function *both* as a recovery water heater to heat and maintain a stored reserve of hot water and *also* as a booster water heater to *raise* the hot water from the storage tank to a *higher* temperature to supply a separate, specific demand, this two-temperature water heating system may be employed *only* where the characteristics of the hot water demand fully conform to those described below:

(c) The demand for hot water at excessively high temperature, requiring the operation of the water heating unit as a booster heater, *must* be *intermittent* and the *combined* time of *all* intervals in which the heater must function as a booster should *not* exceed 20 minutes out of any given hour of peak demand for hot water at both temperatures. The ratio of booster to total operating time *must* be such that approximately *twice* as much time as required for Booster operation will be available for operation of the heater as a recovery unit to heat a stored reserve of hot water in the storage tank sufficient to supply *both* the demand for hot water at normal temperature and *also* that which the heater will be called upon to "boost" to a higher temperature.

(d) The *total* demand for "boosted" hot water during a given hour of peak demand *should not* exceed one half of the *combined* requirements for hot water at normal temperature plus "boosted" hot water at excessively high temperature unless a demand for hot water at normal temperature does not exist. In the latter event the *combined* total of all intervals in which the heater must function as a booster *must not exceed* 30 minutes out of a given hour as the heater will require an equivalent length of time in which to function as a recovery heater to pre-heat the water which it will subsequently be called upon to "boost" to a higher temperature as required.

Note: If the characteristics of hot water demand of a projected two temperature water heating system installation do *not* conform to the above noted characteristics do not install a system of this type unless two or more heaters are employed as described and shown in following pages.

(e) The principal advantage gained by employing a two temperature system lies not only in the fact that but a *single* unit is required to supply both an intermittent demand for water at excessively high temperature and *also* for hot water at normal temperature, but also in the fact that the recovery capacity of the heater need not be as large as would be required were the heater to function as an instantaneous water heater to raise average cold water to excessively high temperature.

(f) Undoubtedly the greatest existing field for the utilization of the two temperature system is in food service establishments where a demand exists for *both* hot water at normal temperature (130° to 140° F.) for vegetable preparation, cooking, pot and pan washing, general cleaning, etc. and *also* for hot water at excessively high temperature (180° to 190° F.) for use in the final sterilizing rinse operation in commercial, spray-type dishwashers. The two temperature system is particularly adapted to this type of service as it so happens that the demand for boosted (180° to 190° F.) water and that for hot water at normal temperatures (130° to 140°F.) are approximately equal or, in other words, the demand for boosted water is approximately one half of the *total* hot water demand. In this respect the characteristics of mess hall hot water demand conform fully to the hot water demand characteristics of a system as detailed in paragraphs (c) and (d), above.

Attention is invited to the manner in which the two temperature water heating system functions and to the fact that only sound engineering principles are employed. Gas-fired systems employing this basic principle have been in successful commercial operation for the past six years.

(g) In operation, such a system differs principally from the conventional, recovery system to the extent that the direction of flow of the recovery water circulation between the water heater and the hot water storage tank is *reversed*, i.e., the hot discharge, circulating line carrying the heated water *from* the hot water outlet of the heater is connected to a tapping in the *bottom* of a horizontal storage tank, while the return circulating line carries the water from a tapping in the *top* of the storage tank to the cold water inlet connection of the heater as will be illustrated in a section following.

Reversal of the direction of flow of the recovery water circulation between the water heater and the hot

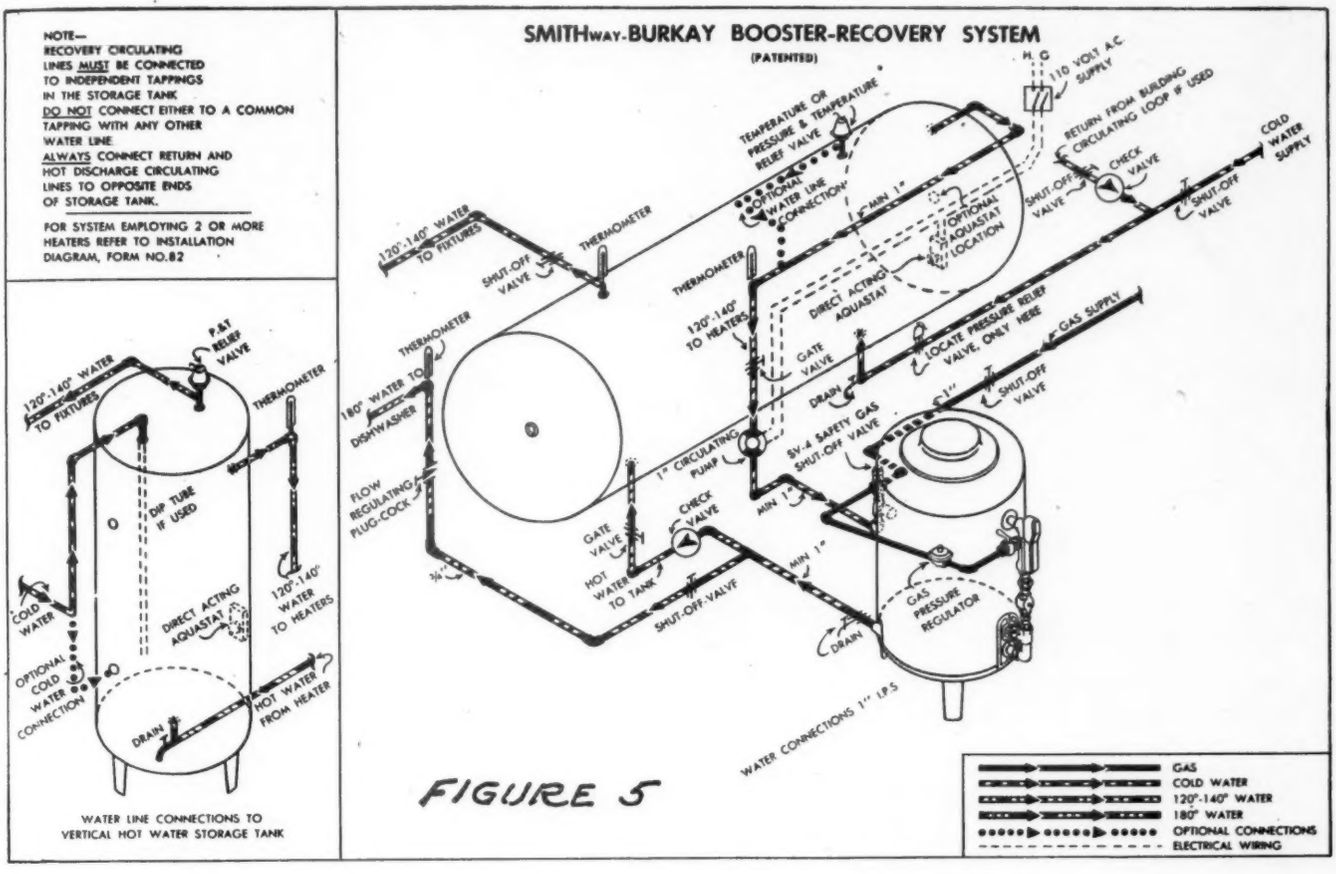


FIGURE 5

water storage tank makes it necessary to employ a standard type of circulating pump in the return, recovery circulating line to compel the circulating water to flow in the direction *opposite* to that in which it would flow were the circulation induced by thermo-syphon or so-called gravity action.

Operation of the circulating pump is controlled by means of a direct acting, immersion aquastat installed in the hot water storage tank. Upon a *drop* in water temperature the aquastat is adjusted to *make* contact, starting the pump coincidentally with the *starting* of the burner in the water heater. When the water in the storage tank reaches the pre-determined temperature the aquastat *breaks* the electrical circuit, *stopping* the pump coincidentally with the *shutting-off* of the heater burner by a separate thermostat.

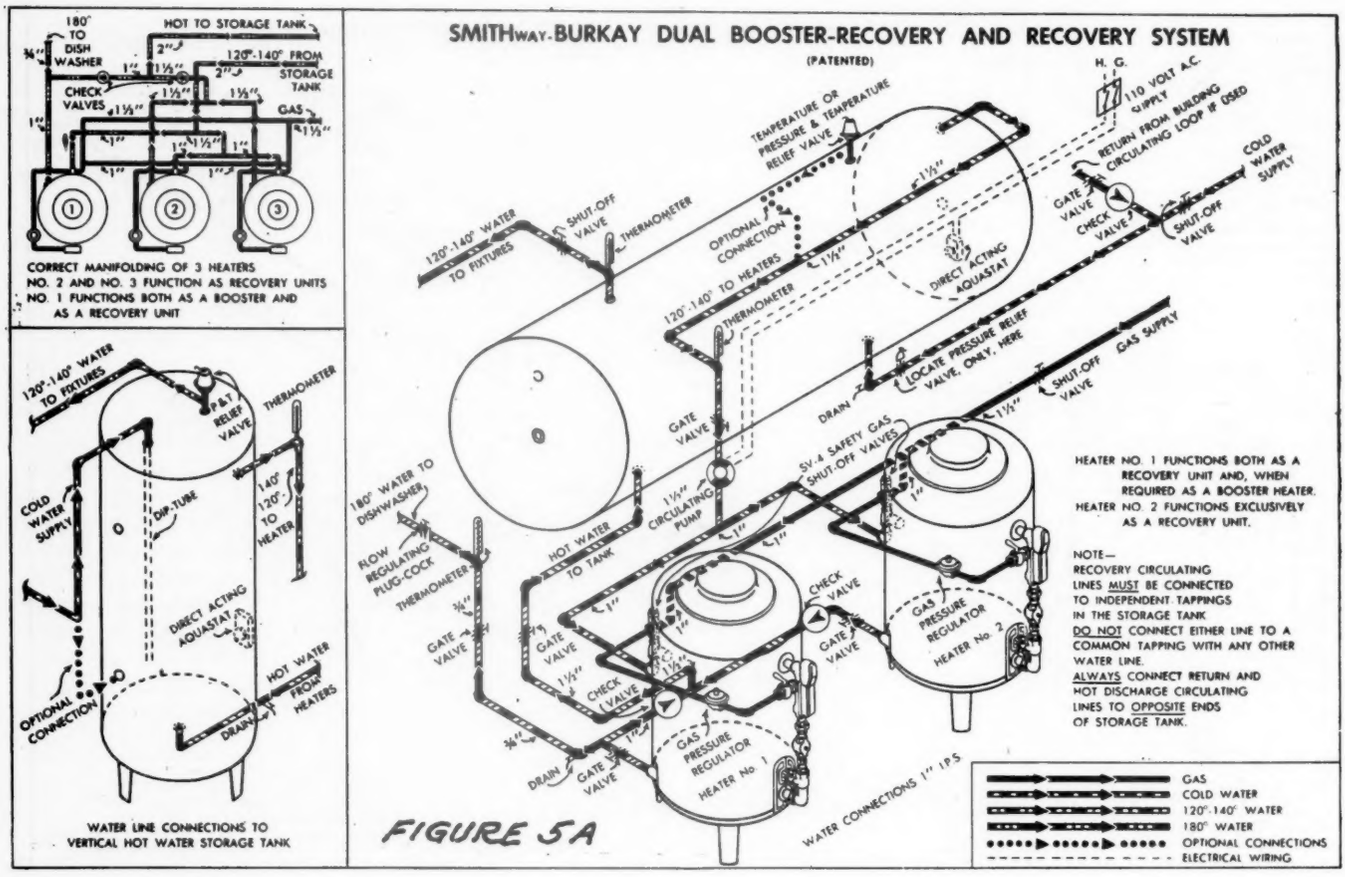
The primary and compelling reason for *reversing* the direction of flow of recovery circulation will be apparent when it is remembered that the water heating unit *must* function as a booster heater when supplying the intermittent demand for hot water at excessive temperature.

Both acceleration of the recovery circulation by pump and reversal of the direction of recovery flow contribute to equalizing the hot water temperature throughout the storage tank. The continuous exchange of water between the storage tank and water heater materially reduces the tendency of the hot water to stratify at the top of the tank while the introduction of the hot water from the heater into the bottom permits diffusion of its temperature, (which may be in excess of that desired in the tank), to the surrounding, cooler water in the lower section of the tank.

Since the 180°-190° water, if used to supply the final rinse water in a spray type dishwater, will be required at a *rate of flow* of approximately five gallons per minute and the water heater must raise the water to that temperature as it flows through the heater when functioning as a "Booster," it will be equally apparent that *less* heater recovery capacity will be required to *raise* five gallons of water—from the upper zone of the storage tank—from 130° to 180°F. than would be required to raise the cooler water from the bottom of the storage tank from a temperature possibly as low as ninety or 100° to 180°F. Reversal of the direction of flow of the recovery circulation between the water heater and storage tank will, as a result of supplying the heater with water at a higher temperature from the *top* of the storage tank, require it to raise the water only forty or fifty degrees F., and assure the maintenance of a stable, minimum temperature of 180°F., in the water delivered to the dishwasher during the booster cycle of operation.

Reference to Figure 5 will reveal the fact that the boosted water ***after*** being drawn from the *top* of the hot water storage tank and *raised* in the heater to 180° F., or higher—is delivered to the point of use by means of an independent supply line branching off the hot discharge, recovery circulating line between the heater and the storage tank. A check valve installed in the hot discharge line between the point where the independent, 180° water supply line to the dishwasher, or other point of use, branches off, and the bottom connection of the storage tank *prevents* the possibility of *cooler* water from the *bottom* of the storage tank back-flowing into, and tempering the 180° F., water.

Should a demand for boosted (180°-190°) F., water occur at the same time as the water heater may be functioning as a recovery unit to replace hot water drawn from the storage tank, the booster cycle of heater operation will *automatically* take precedence over the recovery cycle—the check valve will *close* as a



result of the reduction of water pressure on the heater side of the valve, even though the circulating pump is operating, and the water from the heater, *raised* to 180° F., or more, in temperature will be delivered through the independent supply line to the dishwasher rinse nozzles or other point of use.

As it is necessary that the boosted water be instantaneously available and that operation of the equipment be *fully automatic* to assure maintenance of *stable* temperature in *both* the hot water delivered to the fixtures at normal temperature and in the *boosted* water supplied for the final rinse demand in a spray-type dishwasher or other specific demand, it will be apparent that gas must be employed as the heating medium and that the heater be of the thermostatically controlled instantaneous type.

(2) Gas Fired, Automatic Water Heater

(a) General.

The Burkay, Gas-Fired, Water Heater is particularly well adapted to service in booster-recovery, two temperature water heating systems as the automatic, thermostatic, water temperature control unit, which is an integral part of the heater. It is of the modulating type which reacts, not only to fluctuations in the differential between inlet and discharge water temperature but also to variations in the rate of flow of water through the heater, to maintain the temperature of the high temperatured water delivered to the final rinse in a dishwasher or other specific requirement within very close limits. The fact that this thermostatic control unit, the thermo-sensitive element of which is immersed in a water way in the heater, employs mechanical linkage to proportion the gas burning rate to the required water temperature rise makes it unnecessary to remove it from the heater and reinstall it in the hot water storage tank or to replace it with an aquastat in the hot water storage tank. Neither is a separate, high-limit control required in the heater.

This heater may be employed either singly or in multiple, as shown in a following chapter, in conjunction with a single hot water storage tank.

When installed in multiple the use of two check valves permits *both* heaters to function as recovery units to replace hot water drawn from the storage tank, when required, at such times as *no* demand exists for hot water at excessively high temperature (180°-190°). Should such demand occur coincidentally with a demand for hot water to replace that drawn from the hot water storage tank, *one* heater will automatically function as a booster (to supply the demand for 180°-190° water) while the *second* heater will continue to function as a recovery unit to replace hot water drawn from the storage tank for so long as the temperature of the water in the tank remains below the required, pre-determined temperature.

Where two or more heaters are installed in multiple in a two temperature water heating system it will be apparent that the ratio of high temperatured (180°-190°) water demand to total hot water demand need *not* conform to the ratio prescribed in paragraph *E.* (1), above. Neither need the total time required for booster operation bear the same relation to the required, available time for recovery operation during a *given, peak hour.* For example—in an installation employing two heaters the *combined* time of *all* intervals in which *one* heater must function as a

booster heater may aggregate thirty minutes operation of *one* heater out of a given hour of peak demand.

(b) Control of Water Temperature.

A single direct-acting, immersion aquastat installed in the hot water storage tank functions to *start* the recovery circulating pump upon a *drop* in the temperature in the water in the storage tank and to *stop* the pump when the water in the storage tank reaches the selected, pre-determined temperature. Starting or stopping of the pump induced flow of water through the heater during a recovery cycle of operation and/or starting or stopping of the displacement flow of water through the heater during a booster cycle of operation causes the thermo-sensitive element of the heater thermostat to react to the change in temperature of the water flowing through the heater and *open* or *close* the main gas valve in the thermostat and to also function to proportion the rate of gas consumption to the heating load as described in sub-paragraph (a), above.

(c) Capacity.

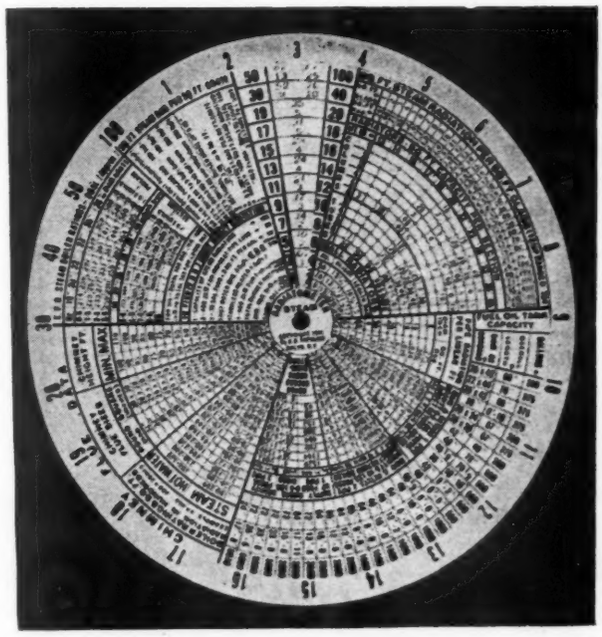
Because of the fact that the heater of a *two temperature* water heating system *must* operate as an instantaneous booster when supplying high-temperatured water, it is necessary to visualize its capacity in gallons of hot water supplied *per minute* at a given water temperature rise. It is also advisable to anticipate the possibility of the heater having to occasionally raise the water temperature more than the normal number of degrees, F., when functioning as a booster. For example—while a two temperature water heating system, designed to maintain the stored, hot water at a temperature of 130° F., would require the heater to raise the water temperature only 50° F., when functioning as a booster to supply 180° F., water, the heater might, during a period of excessive hot water demand, be required to raise the water temperature 70° F., if the temperature of the stored, hot water should *drop* to 110° F.

It is also necessary to visualize the recovery capacity of a heater in a booster-recovery temperature water heating system in terms of the number of gallons of water which it can raise—*per minute*—from the cold water supply temperature to that required in the hot water storage tank as only a portion of the time during an hour of peak, hot water demand

(Concluded on page 68)

Quick, Accurate Answers for Heating and Water Heating Jobs solved by the

Heat-O-meter



Direct readings appear on the Heat-O-meter, covering factors entering into all heating calculations.

The Heat-O-meter employs three concentric celluloid printed discs. Outside disc, 6¼" diameter, is printed in red on both sides. The inner discs are printed in black with a cut-out V sector.

It covers sizes of mains, returns, risers, radiator sizes and capacities, round and sectional boiler net ratings, chimney flue sizes, capacities and heights. Also hot water and fuel tank sizes and capacities, hot water generator capacities, etc.

A real necessity and time saver for

Heating Engineers and Salesmen
Architects and Builders
Heating Contractors
Plumbers and Steam Fitters

The Heat-O-meter gives instant reply to all questions without laborious calculations. Used by many leading Heating Engineers. Price $5 each, postpaid.

AMERICAN GAS JOURNAL
53 Park Place, New York 7, N. Y.

Please enter our order for.....Heat-O-Meter at advertised price of $5. each.

☐ Remittance herewith ☐ Send C.O.D. ☐ Send bill.

NAME .....

ADDRESS .....

CITY ..... ZONE..... STATE.....

say GAS PURIFICATION to a housewife and you'll draw a *blank* . . .

but she's *wise* when it comes to RESULTS

for sweeter gas for cleaner, more satisfactory gas purification

Consult a Lavino Specialist

LAVINO ACTIVATED OXIDE

MAXIMUM H_2S REMOVAL PER LB. OF OXIDE

Supplied in unmixed or sponge forms.

E. J. LAVINO and Company

1528 WALNUT ST., PHILA. 2, PA.

GAS METERS

ARMY E NAVY

RADAR

Lambert Meter Co.

Plainfield, N. J.

COMPLETE GAS PLANTS
INDUSTRIAL FURNACES

•

Automatic Water-Gas Controls
Hydraulically-Operated Valves
for Air, Gas, and Steam

•

The GAS MACHINERY CO.

CLEVELAND, OHIO

CLEVELAND

"A" TYPE METERS
"B" TYPE METERS
DIAPHRAGMS

Cleveland Gas Meter Co.

ESTABLISHED 1875

2009 Rockwell Ave., Cleveland 14, O. Phone CHerry 2351

RECENT COURT DECISIONS *Affecting Gas Utilities*

New Gas Explosion Suits

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

DURING the past few months the higher courts rendered many unusual and outstanding decisions involving gas explosions. Seldom in so few months have so many important decisions been rendered designed to assist readers to avoid similar law suits.

These cases are briefly reviewed. Therefore, it is advisable that readers clip and save these citations for future reference. Also, any case can be read in detail in any good library by referring to a specific citation for identification. Not only will knowledge of these suits assist to avoid future litigations, but these modern citations may be used to win unavoidable law suits.

Ordinary Care

According to a late higher court decision a gas company is only required to use such degree of care as an ordinarily prudent person would exercise under like circumstances. Ordinary care is a "relative" term, and its exercise requires precautions commensurate with the dangers to be reasonably anticipated under the circumstances.

For example, in Stephens v. Kansas City Gas Company, 191 S. W. (2d) 601, reported February, 1946, it was shown that a person named Stephens sued the Kansas City Gas Company for $25,000 damages for personal injuries alleged to have been sustained by reason of the negligence of the gas company.

Stephens was employed as a porter in a barbershop in the basement of the Grand Avenue Temple Building, a 12 story office building. While engaged about his work, he was injured by an explosion which occurred in a basement of the building.

During the trial testimony was given that there had been complaints of the smell of gas in the basement of the building for 3 months before the explosion. The gas company had been notified and tests had been made every week in the vicinity of the gas meter, but nothing was found. After the explosion gas was smelled at an opening in the sidewalk at street level and above the gas meter location. The 4 inch gas main was found to be broken at a point some 35 feet from where the service pipe entered the building, that is, about 42 feet from the center of the explosion. Soil removed from about the break in the gas main was colored as it would have been from long exposure to escaping gas.

In view of this testimony the higher court held:

"The sole issue presented is whether the petition states a cause of action against the gas company. The petition sufficiently alleged that the gas company was negligent and that the explosion and plaintiff's injuries were caused thereby. . . . Whether the gas causing the explosion came from the house pipes, the gas main or from some other source was a question of fact. Whether the leaks in the house pipes or the break in the gas main, either or both, existed before the explosion were questions of fact. . . ."

Also, see Nomath Hotel Company v. Kansas City Gas Company, 223 S. W. 975, 980. This Court of Appeals said:

"It is true, owing to the very dangerous character of gas and because of its well-known tendency to escape from the mains and percolate through the earth into cavities or openings and there burn or explode, causing great injury, the defendant is charged with a very high degree of care in the transmission and control thereof. * * * A gas company is not an insurer, but is held to a degree of care commensurate with the dangerous character of the commodity it handles."

In other words, the law now is established that in view of the highly dangerous character of gas and its tendency to escape, a gas company must use a degree of care to prevent the escape of gas from its pipes proportionate to the danger which it is its duty to avoid. See Taylor v. St. Joseph Gas Company, 185 Mo. App. 537; Brauer v. St. Louis County Gas Company, 238 S. W. 519; and Hanson v. City Light Company, 178 S. W. (2d) 804.

Both Employer and Employe Liable

It is well established law that all persons and firms are liable for damages caused by their negligence. Thus, an employer may be liable for negligence of his employe, and the latter is also personally responsible for his own negligence.

For illustration, in Sears, Roebuck & Company v. Creekmore, 23 So. (2d) 250, reported November, 1945, the testimony showed facts, as follows: A home owner purchased from a seller some linoleum as a floor covering for the kitchen. The contract included complete installation. The seller's regular employe who ordinarily laid such coverings was not then available and the seller engaged another to do the job. The employe requested that the kitchen be heated inasmuch as the weather was too cold for a satisfactory manipulation of the material. Accordingly a gas stove and a water heater which were then lighted were allowed to remain in operation. It was therefore an essential incident of his work to maintain such heat. After the material had become pliable, he shut off the gas, moved the stove after disconnecting it from the gas supply.

The gas supply was not cut off, but the employe was furnished a wet cloth with which he plugged the open end of the fuel pipe and proceeded with his work. When he had completed laying of the strip beneath the stove, the improvised plug in the pipe was removed and he attempted to reconnect the pipes while the gas pressure was still present. Escaping gas, ignited unquestionably by the pilot light of the water heater, burst into flames. Despite confused efforts to suppress the flames, they spread until the home and most of its contents were completely destroyed. The property owner sued both the seller and the employe for damages. In holding the property owner entitled to a full recovery of damages, the higher court said:

"Burley (employe) was of course acting with full authority in laying linoleum. Such activity was not merely in the course of his employment; it was his employment. Such tortious conduct consists not in doing the thing for which he was employed but in doing the job in a manner or by means which constitutes negligence."

With respect to liability of the seller for negligent acts of the employe, the higher court said:

"Burley (employe) was not of course employed to move stoves, nor for that matter to drive trucks. Yet, both activities were undertaken by him as a necessary incident to the ultimate accomplishment of his prescribed task. In disconnecting the gas pipes, he had not abandoned his employment and gone about some purpose of his own. . . . In this conection, Burley disavowed any expert capacity as a plumber. He engaged in no gas fitting or plumbing business. Yet he affected to know from long experience how to handle gas fittings and kitchen equipment and for years carried equipment and tools adapted to these ends. By his own statement, he acquired this proficiency as an incident of the requirements of his own special vocation of laying linoleum."

Park Not Governmental

Modern higher courts consistently hold that a city is not liable for negligence of its employes who perform governmental functions. However, operation of a public park, according to a late higher court decision.

For example, in Gorsuch v. City of Springfield, 61 N. E. (2d) 898, reported May, 1945, it was shown that a city is the owner and trustee of a public park grounds, located within its corporate limits and known as "Snyder Park," which it maintains and operates through the agency of the Board of Park Trustees.

Among activities of the trustees in connection with such park is the maintenance and operation of a golf course upon the park property where citizens and others are invited, solicited and permitted to play golf under certain conditions and rules and upon payment to the city of certain fees for such privilege, with the result that the city has built up a large patronage of the golf course and each year collects substantial sums of money from its patrons.

The trustees erected upon the park property, adjacent to the golf course, a building designated as the Snyder Park Club House, for the benefit and convenience of those patronizing the golf course, and such building contains, among other things, a lounge, a locker room, a room equipped with showers for shower baths, and a boiler room.

One day the park superintendent applied a lighted match to the pilot light of a water heater, with the result that there was immediately a terrific explosion of escaped gas which inflicted serious injuries upon persons in the building. These persons sued the city for damages for serious injuries sustained.

IT PAYS TO CUT THIS COUPON

Here's a coupon with top value for the holder—*your gas holder.*

From it you'll get *positive* information about the internal condition of your wet-seal gas holder—information that will save you money in reduced maintenance and replacement costs. You'll be able to safeguard failures due to corrosion, misalignment or improper lubrication.

The coupon method of internal inspection is only one of the steps in the Stacey Brothers Gas Holder Inspection Service. Based on scientific survey, thorough examination, laboratory tests and engineering study, we'll give you a comprehensive report and specific recommendations to help you insure maximum life for your holder.

Now's the time to let us give you this personalized annual inspection service. Many prominent operators already have entered their contracts with us for the 1946 season . . . and we've served some of them year after year. Their contract renewals are your best assurance of our ability to give you prompt, economical and efficient inspection. May we discuss your requirements with you?

STACEY BROTHERS GAS CONSTRUCTION CO.
One of the Dresser Industries
5535 VINE STREET • CINCINNATI 16, OHIO

Coupons are cut with a special disc-cutter like this. An Archimedean screw holds the cutter in position, clamps the rubber sealing base ring tight against the holder shell, and prevents the coupon from falling into the holder after it is cut.

This and many other features of Stacey Brothers Gas Holder Inspection Service are described in a 16-page illustrated catalog, number I-44 Write us for your copy.

Stacey Brothers TANKS

During the trial the testimony showed that a certain flat spring, controlling the pilot light of the water heater, had theretofore become defective in the respect that a portion of the same was broken off so that notwithstanding extinguishment of the pilot light, natural gas would continue to feed into the heater and would be ignited upon contact with any flame. It was alleged that the superintendent, negligently and carelessly attempted to re-light the pilot light in the heater in a manner contrary to the warning and instructions printed thereon, and that the explosion resulted.

The counsel for the city argued that the latter could not be held liable in damages, first, because operation of the golf course and building in the public park is a governmental function; and second that there was no negligence of the city in the plans or construction of the building or equipment installed therein, including the hot water heater. Notwithstanding these contentions the higher court held the city liable, saying:

"Under the evidence, the jury was amply warranted in finding that the park superintendent was negligent in attempting to re-light an automatic water heater without complying with the instructions relating thereto and that his negligence in that respect was the proximate cause of plaintiff's injuries."

The higher court held that operation of a park is not a governmental function, saying:

"It is sufficient for the present case to say that if the city in the maintenance and operation of its municipal golf course was directly compensated or benefited. . . . The benefits consisted in obtaining the money from privilege fees, etc., with which to make permanent improvements to the park, and by securing a profit therefrom the taxpayers of that city were relieved to that extent from the levy of taxes for that purpose."

Negligence Not Presumed

Where a property owner's negligence results in explosion of gas, the property owner solely is liable and responsible.

For illustration, in Koehler v. Thiensville State Bank, 14 N. W. (2d) 15, an employe in a bank sued both the bank and a gas company for damages as a result of an explosion of gas in the bank.

The testimony proved that the gas system was properly installed, had no mechanical defects, was adequately inspected and was maintained in perfect mechanical condition. In view of this testimony the higher court held the bank corporation solely liable, thus relieving the gas company from liability, saying:

"The inference of negligence which in a proper case may be drawn from the accident itself is one of fact, and the authority of the jury to decide whether it should be drawn can be excluded only in presence of undisputed proof, not merely testimony, that such negligence did not occur."

Must Prove Negligence

It is true that a gas company may be liable in damages for an explosion of gas caused by negligence of its service man in properly adjusting gas apparatus. However, the fact that a service man made adjustments will not result in the gas company being liable, unless the injured person positively proves that negligence of the service man caused the explosion.

For instance, in Raftery v. Kansas City Gas Company, 169 S. W. (2d) 105, it was shown that a property owner attempted to use hot water and found it was cold. He told his son to go down and see if the heater was lighted. He went to the basement and opened a small door at the bottome of the heater and saw no light, and thought the gas was off and that he could light the pilot burner without danger. He lighted a match and when he brought it near the small door there was an explosion, severely burning his hands and face. He testified that he had never before attempted to light the heater; did not know where the valves were and did not look to see if the gas was turned on. Other testimony showed that some two weeks before the day of the explosion, the gas company's service man had adjusted the pilot.

In view of this testimony the higher court refused to hold the gas company liable, saying:

"There was not a scintilla of evidence that the flue was clogged with soot at the time defendant's service man was last there. . . . This record conclusively shows that when defendant's service man was last there the pilot light and burner worked properly and continued to do so for two weeks or more thereafter. Therefore, this is not a case where the damage complained of followed the alleged negligent act in an unbroken sequence."

Negligence

Negligence is the "failure" to exercise the degree of care which an "ordinarily prudent man" would exercise under the same or similar circumstances.

For illustration, in Stumpf v. Panhandle Eastern Pipeline Company, 189 S. W. (2d) 223, it was shown that an employe of a power company sustained severe injuries when the explosion of a dynamite charge burst a high-pressure gas pipeline. The escaping gas was ignited by the explosion, and flames enveloped the employe.

The employe contended that the gas company was liable because it failed to maintain warning signs or markers of the location of its line.

The higher court refused to hold the gas company liable, but stated that in a new trial it may be liable if the testimony proved that its officials failed to use "ordinary care" to warn strangers of the location of its pipe line.

Hays Corporation Adds Flow Meters to Their Line

The Hays Corporation, Michigan City, Indiana, announces that Cochrane Flow Meters, formerly manufactured by The Cochrane Corporation of Philadelphia have become a part of the Hays line of products.

The flow meters will continue to be manufactured in Philadelphia by The Penn Industrial Instrument Corporation — an organization comprised of the same men who have been responsible for the production of these meters for many years.

Mr. Daniel Meyer and Mr. Fred Skirving, who have been associated with the instrument division of Cochrane Corporation for a number of years, have joined the Hays engineering staff at Michigan City.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

Twenty-Second Annual Distribution Conference

THE Distribution Conference and the Conference on the Operation of Public Utility Motor Vehicles, held their meeting in Chicago April 15, 16 & 17.

T. H. Kendall, Chairman, Distribution Conference presided at the opening meeting.

Karl B. Nagler, Vice-President, Peoples Gas Light & Coke Co., Chicago, welcomed the delegates to Chicago, and stated that his company had made application for membership in the American Gas Association, and expressed the hope that many of the men in his organization would again become members of the various A.G.A. Committees to do their part in furthering the interests of the gas industry.

He described the distribution system of Chicago and invited the delegates to visit any part of the system in which they might be interested.

E. J. Boothby, President of A.G.A. delivered a "Message from the Association." Mr. Boothby talked about the more important activities going on at headquarters, and particularly emphasized the vast research and promotional programs underway. He also stated that a committee was being appointed, composed of association officers and committee chairmen to conduct a market research program, which would be of great value to the industry.

Wolf on Distribution

The talk by H. Carl Wolf, Managing Director of the American Gas Association was on the subject "Distribution—A Vital Link."

"Four billion dollars," Mr. Wolf stated, "is a lot of money. That happens to be about the amount which is invested in the gas distribution systems of this country and for which the group represented by you men here is responsible. That indeed is a grave responsibility.

"Twenty million, five hundred thousand customers look to you for service and are dependent upon you for a portion of their daily living. Industries making almost every kind of article used are also dependent upon you. Your job is a tremendously important one.

"People are constantly moving, their requirements for service changing, new methods being developed and new problems arising. You must be prepared to meet these changes. Your job is itself a changing one.

H. Carl Wolf

"A sincere desire and delight in rendering service, unsung, sometimes unrecognized, without regard to time or convenience is a prime requisite for one in your position.

"For these and other reasons I say that distribution is a vital link, that your job is a challenging one, exacting and demanding.

"The gas industry, characterized as it is as one of large investments and devoted to the single purpose of rendering service, has ever been one of change and of new opportunity. We can point to mains that have stood the test of time and rendered faithful service for over a hundred years. We can point to new discoveries that will determine the usability of mains and equipment for future centuries. We have seen the gas industry meet challenge after challenge, both in war and peace and emerge the stronger for that challenge.

"With all of the advancement in the science of distribution the fact remains that there lies before us a big problem of cheapening distribution costs, both capital and operating, so that we can bring to more people the advantages which gas has to offer. We are in a fiercely competitive age, growing more so. Gas has universal acceptance, is in great demand for many uses, particularly house heating. But we can not be complacent about our market and unmindful of the added problems which this demand brings. New methods, new materials, must be developed. New thinking on many of our problems is requisite.

"The research program of A.G.A. can help in this respect. A number of projects are now under way and results should be soon forthcoming.

Left to Right: J. M. Pickford, Chairman, Subcommittee on Work on Customers' Premises, from Northern Indiana Service Co., Hammond, Ind.; H. B. Andersen, Chairman, Subcommittee on Economics of Distribution Design for Domestic Load Building, from Philadelphia Gas Works Co.; D. M. Workman, Chairman, Subcommittee on Distribution Developments, Ebasco Services Inc., New York City; E. L. Henderson, Chairman, Construction & Maintenance, United Gas Corporation, Houston; L. K. Richery, Chairman, Subcommittee on Safety, Michigan Consolidated Gas Company, Detroit.

Additional projects are suggested constantly. Let me urge you, each of you, to make known any suggestions you have for research on an industry level that might lead to solution of some of these problems ahead.

"Personnel problems are becoming more complex. The artificial barriers being set up in many employe contracts make it difficult to attain maximum results. At the same time they are a spur to the discovery of new methods. Our whole conception of handling work is undergoing kaleidoscopic changes as is our conception of handling workers. The basic need for the human touch still remains however, as does the necessity for real leadership. The formula which has given us as a nation, the highest plane of living in the world, applies equally well to the individual — to produce more and more, better and better goods to be sold at cheaper and cheaper prices. This formula is especially important in the gas business which has been built on the basis of service at reasonable rates.

"The necessity for cheaper cost of our distribution plant is emphasized by study of the probable trend in housing over the next several years. Practically every survey shows that people are desirous of moving out of crowded urban areas into suburbs, even rural areas, with wide lots and sparsely located houses. During the next two years the government aims to build two million seven hundred thousand homes—many of them in outlying areas and many desiring gas service. The unparalleled demand for gas house heating is coming principally from the newer houses located on the outskirts of our territory. We must, if we are to serve these customers economically, find cheaper methods of extending our lines. This may mean higher pressures, less exacting engineering standards, construction engineered for shorter life, the use of more labor-saving equipment or it may mean new materials. It is likewise a challenge for the development of new utilization methods and equipment to improve load factors.

"Utilization problems are perhaps being given more attention today than are many of the industries' problems. Your program here reflects the importance you attach to the problems arising on the customers' premises. In this competitive economy into which we are rapidly moving, customer service and the customers' viewpoint are more important than ever. There will be a great race for the customers' dollar and the industry which convinces the customer that he is getting the most service for his dollar is the industry which will win. It is easy for a customer to judge us by the few manifestations he can see—his appliances, our meters and piping, the way we do our construction work, the smile he gets from our meter reader, the confidence he has in what our serviceman does and says. To win in this race, we must build up carefully trained crews, adapt the most businesslike methods and streamline and improve equipment and appliances. The customer is our boss and on his opinion of us and of our service depend our jobs.

"Without doubt, the job of the Distribution Department is a big one. Distribution is a vital link in our business. We have an opportunity and a responsibility. The gas industry stands at the threshhold of unlimited potentialities. The degree to which you shoulder your responsibilities and forge strong that vital link will govern in large measure the degree to which the industry crosses the threshhold of its potentialities. I am confident that we shall cross the threshhold and push valiantly and aggressively on to a new and higher plane of service and profit, holding our own and gaining ground in that dynamic competitive era ahead of us."

Left to Right: Stephen P. Cobb, Ebasco Services, Inc., New York; L. J. Willien, Institute of Gas Technology, Chicago; L. J. Eck, Chairman, Technical Section, Minneapolis Gas Light Company.

A series of papers on radio in distribution work followed.

"Use of Radio in Distribution Work" was a presentation on the practical application of radio and what the distribution man can expect of the radio of the future in company work.

"Emergency FM Radio Communication," was presented by J. P. Woodward and W. R. McMillan, Union Electric Company of Missouri, St. Louis, Mo., and "And Now — Mobile Radiotelephone Service" by S. S. Brodsky, Illinois Bell Telephone Co., Chicago, Ill.

The following Luncheon Conferences took place Monday afternoon.

Motor Vehicle Round Table Luncheon Conference

S. G. Page, Chairman, Motor Vehicle Committee. Subjects discussed were Motor Vehicle Problems, Linn Edsal, Chairman, Philadelphia, Pa.

Training of Maintenance Supervisors, Carl G. Seashore, Associate in Charge of Motor Fleet Safety Education, The Pennsylvania State College, State College, Pa.

Fluid Drive, W. L. Carnegie, Chief Engineer, Detroit Transmission Division, General Motors Corporation.

Driver Testing, F. M. Rudman, Michigan Consolidated Gas Company, Detroit, Mich.

Distribution Round Table Luncheon Conference

J. H. Collins, Vice Chairman, Distribution Committee and Chairman, Luncheon Conferences Committee.

Luncheon No. 1: Meters and Metering; A. V. Brasher, Chairman, Detroit, Michigan.

Luncheon No. 2: Construction and Maintenance; E. L. Henderson, Chairman, Houston, Texas.

S. G. Page, Chairman, Motor Vehicle Committee, presided at the Tuesday morning meeting. The first paper was on "Compressor Tools—Their Maintenance and Repair," presented by B. D. Connor. It was a report of the Subcommittee on Compressor Tools based on a survey of the practices and opinions of 20 gas companies and 7 tool manufacturers and rebuilders.

"Standardization of Motor Truck Bodies" was the title of a paper presented by Sidney F. Gale, Chairman, New Orleans, La. In discussing the subject, Mr. Gale said:

"With the application of the motor truck to the utility industries, a special group of bodies appeared that are commonly referred to as "utility bodies." These bodies have been applied in the gas industry, the electric power industry and the communications industry, but have not reached the degree of standardization attained by commercial bodies. It is doubtful whether utility bodies will ever reach a high degree of standardization because the requirements of the utility companies are quite varied and this limits the number of bodies of any one model or type. However, there appears to be no truly valid reason why the bodies in any one type classification cannot be standardized to a greater extent than at present, or the functions of one or more present types combined in a standardized design.

Two types of Utility Truck Bodies.

Left to Right: C. S. Goldsmith, Vice-Chairman, from the Brooklyn Union Gas Co., Brooklyn, N. Y.; L. K. Richey, Chairman Subcommittee on Safety, Michigan Consolidated Gas Co., Detroit.

"Before standardization can be accomplished some compromise must be made between the needs of the operator or user of the body on one hand, and the needs of the body manufacturer on the other. A large number of operators believe that they have working conditions on their properties that differ from those found on any other property. They also have pet ideas about the proper way to carry different materials on their trucks. These beliefs prompt them to request changes in the design of standard bodies that are offered them, or to pay the additional cost of a body designed and built according to their special requirements. The body manufacturer would like to build one body and sell it to all purchasers without change, because he can thereby obtain sufficient production to justify expensive tools and equipment that will help him to lower production costs and produce a better product.

"To sum it up—the operator needs good, low priced bodies delivered off the shelf that can be adapted to his special requirements. The manufacturer needs volume production of standard bodies in order to give the operator good, low priced bodies with off-the-shelf delivery."

Mr. Gale suggested that a committee be formed to endeavor to specify a truck body design that would most nearly meet the requirements of most companies, and then consult with the makers to work out the details.

"Accident Prevention — Not a One Man Job," was presented by E. C. Woodward, Illinois Institute of Technology, Chicago, Ill. It was an informative presentation by the Accident Prevention Committee of the American Gas Association.

Luncheon Conferences were held Tuesday afternoon. S. G. Page was Chairman of the Motor Vehicle Luncheon and the subject discussed was the broad one of "Motor Vehicle Problems."

Left to Right: H. A. Sautter, Bridgeport Gas Light Co., Bridgeport, Conn.; William Minyard, Southern Counties Gas Co., Los Angeles; E. F. Woodward, North Penn. Gas, Port Allegheny, Pa.

J. H. Collins was Chairman of the No. 3 Luncheon Conference, and the main subject for discussion was "Work on Customers' Premises," led by J. M. Pickford, Hammond, Ind.

Luncheon No. 4 discussed "Pipe Coatings and Corrosion," and the Chairman was R. F. Hadley, Philadelphia, Pa.

Wednesday morning, Dr. Kent M. Wight, Research Associate, A.G.A., presented a paper titled:

"The Effect of Anions on the Performance of Sacrificial Anodes."

The paper, "The Automatic Loading of District Governors" will be found in this issue of the *Journal.*

"The Supervisor's Part in Industrial Relations" was title of a paper presented by E. O. Keller, The Philadelphia Co., Pittsburgh, Pa. He stated that the supervisor is the most instructive influence in a worker's job life, and should always be kept fully informed on company policies, or changes in them.

Joint National Accounting Conference

Ramifications of the accounting systems of the nation's gas and electric utilities underwent a searching analysis at the annual Spring Conference held April 1-3 at the Netherland Plaza Hotel, Cincinnati, Ohio. Sponsored jointly by the American Gas Association and the Edison Electric Institute, the three-day meeting attracted more than 600 registered delegates, representing virtually every part of the country. It was by all odds one of the most fruitful and satisfying in a series of meetings which is noted for its accomplishments.

Under the leadership of A.G.A. Accounting Chairman Edwin F. Embree, New Haven Gas Light Co. and E.E.I. Accounting Chairman Harold F. Scaff, Ebasco Services, Inc., the conference covered many problems of broad scope and individual interest. Within the framework of one general session, four parallel group meetings, a series of committee workshops, and a dinner and luncheon were packed the reflections and working time of an entire network of committees in the gas and electric industries, all of whom contributed much to the success of the affair.

The first speaker at the general session was Dr. Walter E. Spahr, Professor of Economics, New York University, and executive vice-president and treasurer, Economists' National Committee on Monetary Policy, who presented a vigorous denunciation of the national fiscal policy since 1933, describing it as "little short of fiscal insanity."

Dr. Spahr offered the conference several remedies for what he termed a fiscal policy that treats government debt as prosperity and thrift as an anti-social act. These included an overall fiscal plan, better organization and staffing of congressional appropriation committees, an annual audit by the Comtroller General of all government agencies and corporations, discontinuance of indefinite appropriations, balancing the federal budget and, above all, a return to a gold coin standard in order to return to the public control over the public purse.

Norman D. Cann, tax consultant and formerly deputy commissioner of internal revenue at Washington, made an interesting talk on "Phases of Tax Administration," giving helpful suggestions for improving processes of assessing and collecting federal income taxes. He was critical of waste motion in the Bureau of Internal Revenue and called for centralization of authority and establishment as a separate department of the government so as to "eliminate too many hands in settling tax claims."

At the Customer Activities Group meeting on Tuesday afternoon, Paul E. Ewers, Michigan Consolidated Gas Co., Detroit, presented a report of a joint subcommittee of the A.G.A. and E.E.I. Customer Relations committees entitled "A Customer Service Policy." Mr. Ewers urged the industry to keep constantly abreast of the changes in customer attitude by broadening and extending its services and outlined the desirable standards of an idealistic customer service policy.

The remainder of the meeting was devoted to a panel discussion of the recent special joint report on customer activities and procedures entitled "Customer Accounting Practices and Policies." This report, embodying the results of two years' study and research by the special joint committee, consists of about 90 pages of concise data and comment covering every phase of customer accounting activities.

The Customer Relations Committees listened to a paper describing "A District Representative Plan" which is used by the Central Hudson Gas and Electric Co., Poughkeepsie and was presented by John R. Gardner of that Company. The plan calls for all work involving entry into the customers' premises or personal contact with customers in a given area to be performed by a single employee designated as a commercial representative—thus requiring a company's territory to be divided into districts. It was agreed that the plan has merit and could advantageously be adopted by many companies operating in widely scattered rural territories.

Several matters involving inequities of the Internal Revenue Code were reported to the Committee on Tax Inequities and a general discussion followed as to the possibilities of mitigating of such items.

A popular feature of the conference was an exhibit of various accounting machines which brought the delegates up-to-date on developments in the public utility field. In summary the conference offered many things to many people and few left it without a feeling of complete satisfaction that it had fulfilled its purpose in all respects.

TRAIN NOW—RELAX LATER

Use the "Service of Selling" Books as Your Sales Training Aids

The big news in the business world is Sales Training. Executives everywhere anticipate the briskest competition American markets have ever experienced. Don't be misled by false security. Start training your staff now in the modern scientific methods set forth in this set of 3 cloth-bound volumes, expressly written for the home appliance salesman. Only $4.00 per set. Order today.

THE CLEVELAND HEATER CO.

2310 Superior Avenue Cleveland 14, Ohio

Safe Distribution Practices

L. K. Richey
Distribution Subcommittee Chairman
Michigan Consolidated Gas Company
Detroit, Mich.

Barricading

BARRICADING has for its objective the protection of the general public and employees against personal injury or property damage.

To provide adequate barricading it is necessary that the neighborhood be studied as to the habits of residents, movement of pedestrians, children at play or on errands, business activities, automobile concentration and traffic speeds, physical features of roadway—curved or straight, rolling or level—and a decision made as to the type, number, and location of barricades. Barricading should be done in accordance with all state, county, and municipal ordinances.

Barricading on any job should be done promptly for the first cycle of traffic is always a very critical period. Barricades should be sturdily constructed, clean, free from slivers and painted with a distinctive color to provide maximum visibility.

Placing the Barricades

1. The barricades should be so placed as to be readily visible to the approaching traffic. The distance of the barricades from the work area will depend upon the volume and speed of traffic. In general, they should be placed to divert the traffic smoothly before it reaches the work area. When the normal flow of traffic in established routes (sidewalks, paths, roadways, lanes, etc.) cannot be maintained safely, other safe means of passage across or around the work area should be provided.

2. The barricade enclosure should contain all equipment, tools and excavated material whenever practicable.

3. Placing of barricades should be done in a manner to minimize tripping and falling hazards.

4. Pedestrians and property, especially windows, should be guarded from flying pieces of concrete or other materials. A canvas or wooden shield will provide this protection.

5. Where workmen are exposed to traffic hazards the barricades should be placed to permit the maximum amount of work to be done within the enclosed area. Equipment or excavated material may be placed upon the upstream side of traffic to provide additional protection.

6. The use of planking over an excavation next to the sidewalk or for covering an excavation when not being worked adds to the protective features of barricading. It is advisable to cover openings in a heavily travelled area with steel plates, removing all barricading, equipment and excavated material which would interrupt traffic. These plates must be anchored securely.

7. A flagman with a conspicuous flag should be used when needed at critical points.

Barricade Lighting

1. Both flares and lanterns in adequate numbers should be used to provide a visible warning at night. Flares are more readily noticed than lanterns.

2. Flares should not be placed in the path of pedestrians or where they are likely to be extinguished by the movement of traffic.

3. When leaking gas is present, the barricades and lights should be placed to keep vehicular and pedestrian traffic at a safe distance from the point of leakage. Extreme care should be taken to insure that open flames will not be brought near.

Chain Falls

General—A chain fall is a hand operated mechanical device used for lifting heavy loads. It should have a rating equal to or greater than the load to be lifted.

When in use the chain fall should be examined periodically, looking for wear of gears, bearings. chain links and chain pulley and defects in chain links and hooks. They should be kept clean and lightly coated with oil to prevent rusting.

Chain Fall Support—A chain fall should be suspended from a strong support such as structural member, an A frame, tripod, crane or a cable sling using either an eye bolt, clevis or suitable fastening.

Load Support—Fasten the lifting hook directly to the load if possible. Otherwise use cable or chain slings making certain that the strain on the hook is vertical and the load is balanced.

Load Lifting or Lowering—The lifting tension should be applied gradually until the load is fully carried by the chain falls, when an observation of the fastening and support should be made. The fastening and supports should be kept under constant observation. When lifting or lowering the operator should stand clear of the load. When lowering the load the operator should keep one hand on the slack hand chain to prevent runaway action.

Wrenches

General—Wrenches are hand tools designed for particular uses such as turning, tightening or loosening nuts, bolts, pipe and pipe fittings. They are not designed for use as a hammer or a pry. The use of extension handles or hammering a wrench handle is an abuse of a good tool. The proper type should be selected for use on round, square or multiple sided surfaces.

Wrenches having worn or sprung jaws, rough or bent handles, broken springs or worn mechanisms should be repaired or replaced. They should be kept clean and lightly coated with oil to prevent rusting.

In using a wrench the workman should take a position that will prevent him from being thrown off balance with possible injury by the slipping of the wrench or by a sudden yielding of the part being turned. The position of the hand on the wrench should be such that knuckles will not be skinned or fingers pinched if the wrench should give way suddenly.

Pipe, Strap and Chain Wrenches—These are designed for gripping round objects. The strap wrench should be used when marring surfaces is objectionable.

The wrench should be adjusted so that the pipe or rod is gripped well back in the jaws. Use only in the direction in which the jaws tighten.

Presented at American Gas Association, Technical Section, Distribution and Motor Vehicle Conferences, Chicago, Ill., April 15-16-17, 1946.

For effective use the teeth in the jaws must be kept clean and sharp. The bite of the wrench should be established by light pressure before full pressure is exerted.

Monkey-Wrenches and End Wrenches—These are designed for use on square or multi-sided surfaces. The jaw depth should approximate the length of the surface to which the wrench is applied. The wrench shall be adjusted to fit the pressure faces snugly.

The non-adjustable end wrench should be selected to fit the part on which it is to be used.

Socket Wrench — This type wrench is designed in cap form to fit all faces of multisided parts and is of great convenience for reaching into inaccessible places as well as for general purposes. Care should be taken to see that the wrench fits closely and has the proper depth for the part on which it is to be used.

Torque Wrench—This is a special tool which is used for obtaining a uniform degree of tension on a series of nuts or bolts. A re-emphasis of the note on keeping a wrench clean is important here.

Meter Orders

General—Meter orders are issued to establish and close customers' accounts through a process of installing, turning on, turning off and removing of meters. Meters shall be handled carefully to avoid leaving an unsafe condition and to prevent personal injury.

Good lighting is essential for safe working.

Personal Preparation—Clothing should fit properly to prevent tripping or catching on objects. Pockets should be in good condition to hold small tools. Shoes should be well fitted and in good condition with substantial soles.

Meter Loading and Unloading—Care should be taken to prevent hand injury from rough edges on meter caps or stem threads and to reduce the possibility of dropping.

Meters should be unloaded on the curb side of the vehicle.

Entering Customers' Premises—Check for holes, protruding objects and ice on streets, sidewalks and parkways.

Observe dogs to determine the normal behavior if possible.

Check steps, porches and stairways for loose, weak or missing boards and loose hand rails. Check for toys, skates and other articles frequently left on stairways.

An observation should be made to detect hanging objects such as clotheslines, hanging or protruding shelves or other objects that may be encountered.

Care should be exercised when walking over highly polished or slippery floors.

Meter Location — When the work is above normal reach from the floor a ladder in good condition should be used and properly placed to prevent slipping or tipping.

Where the work is near the floor and it is desirable to kneel, the floor should be smooth or provided with some padding for knee protection.

The work location should be carefully observed to discover objects that may result in falls, cuts, bruises or abrasions.

Tools—Tools should be used in a manner that will prevent personal injury by slippage or breakage. Proper body balance is important.

Tools should be carried in an orderly manner to facilitate safe handling.

Adequate tools of the proper type and design and in good condition should be available before starting the work.

Tools should be used only for the specific purpose for which they were designed.

Work Execution—The work location should be carefully observed to discover objects that may result in falls, cuts, bruises or abrasions.

Material, equipment and tools should be placed to prevent tripping or falling.

Piping and valves should be observed to determine if they are in good condition and well supported to withstand the strain applied during the course of the work.

Appliance Adjusting

General — Appliances are adjusted to provide safe, efficient, economical and satisfactory operation of gas burning equipment.

Appliance adjustments shall be made in accordance with the approved general practice of the research division of the Utility, the manufacturer or the A.G.A. Testing Laboratory.

Good lighting is essential for safe working.

Tools—Tools should be used in a manner that will prevent personal injury by slippage or breakage. Proper body balance is important.

Tools should be carried in an orderly manner to facilitate safe handling.

Adequate tools of the proper type and design and in good condition should be available before starting the work.

Tools should be used only for the specific purpose for which they were designed.

Work Operation—An observation of the appliance should be made to determine if in use before adjustments are attempted.

A check should be made of remote controls to prevent operation occurring while adjustments are being made.

Check work area for objects which may fall or be tripped over.

Protection for the hands should be used when it is necessary to adjust appliances that are hot.

Protection for the eyes should be used to safeguard from splashing liquids or flying objects from an active process, when drilling and on work overhead.

Before attempting to light any burner a check should be made to determine if unburned gas is present.

Meter Tinning

General—The tinning operation prepares meter bodies and parts for the application of solder in the meter assembly process.

Care should be taken to see that the operator's hands and body do not come in contact with the heated parts until they are cool. All pointed projections of solder should be removed.

The sharp edges of tin should be handled carefully in order to prevent cuts from the stripped meter bodies or meter parts.

In tinning meter parts in a solder bath heavy hot pads should be used for efficient and safe handling. The fumes that rise from dipping the oily parts into the molten solder should be drawn off by ventilators.

Files

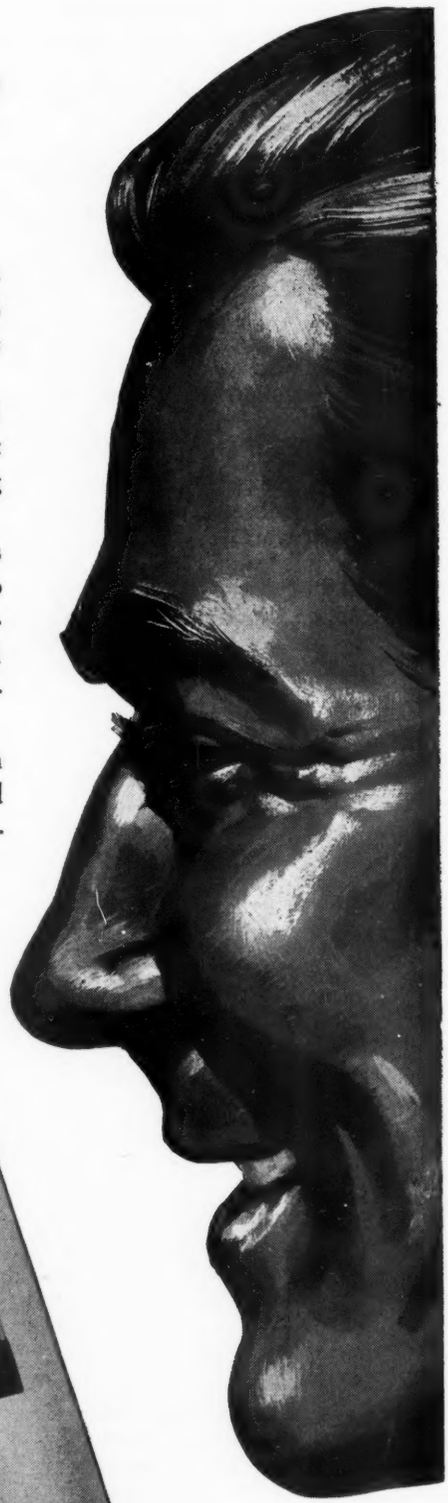
General—The file is a hand tool designed for shaping and smoothing by the removal of material in relatively small quantities. It should be selected for the work to be done, giving thought to the kind, size and cut.

A file should always have a well fitted handle. Place the tank in the hole in the handle and tap the butt end of the handle on a hard object to drive the tang into place. A file is brittle and should never be used as a pry or a chisel.

For most filing the work should be held in a vise which should be at about elbow height. The file should

(Concluded on page 68)

To help increase "Take-Home Savings"



THE Treasury Department has published two new booklets to help you and your employees realize the utmost benefit from your Payroll Savings Plan—benefits proportioned to the extent your employees add to "take home savings" by buying and holding U. S. Savings Bonds.

"Peacetime Payroll Savings Plan" for key executives offers helpful suggestions on the conduct of the Payroll Savings Plan. In addition, it quotes leaders of Industry and Labor and their reasons for supporting the Plan.

"This Time It's For You" is for distribution to employees. It explains graphically how this convenient, easy thrift habit works. It suggest goals to save for and how much to set aside regularly in order to attain their objectives. If you have not received these two booklets, or desire additional quantities, communicate with your State Director of the Treasury Department's Savings Bond Division.

See your Payroll Savings Plan through to maintain your share in America's future. It is sound economics and a powerful force for good today—and tomorrow—as a safeguard for stability and a reserve of future purchasing power—money that is kept within your community.

The Treasury Department acknowledges with appreciation the publication of this message by

AMERICAN GAS JOURNAL

Gas Holder Painting By Flotation

A New Method Employed by Consolidated Edison Co.

A NEW METHOD of painting water sealed gas holders, which produces the finest finish at a substantial saving in cost, has been developed by L. B. Donovan, assistant general superintendent of the Holder Maintenance and Painting Bureau of Consolidated Edison Company of New York, Inc. After experiments over the past two and a half years, it was found that the method can save 50 per cent of the cost of painting submersible surfaces. The company has applied for a patent in Mr. Donovan's name and he has assigned all his rights in it to the system. Benefits will be made available, free of charge, to the utility industry upon application to the Consolidated Edison Company.

The husky savings figure and the ingenious new painting idea were unveiled at a recent meeting of the Society of Gas Lighting at New York's Hotel Astor where utility men from the eastern section of the country heard Mr. Donovan's first public description of his flotation application and saw the motion picture which the company made to show how it is done.

In the new method the prime force in painting—the painter's arm—is replaced by the gas pumping facilities at holder installations. With it thousands of square yards of gas holder surface can be covered with a uniform film of paint as quickly as the lifts are submerged and raised again. The trick is the floating of paint on the surface of the water in the holder cups.

Flotation painting saves time, money and labor and results in a quality job free from skips or misses, half painted rivets, air bubbles or any of the common mechanical causes of paint failure. With this system the skill of the master painter is surpassed by the law of hydraulics.

It applies to more than 50 per cent of the area of water sealed holders which require painting. Guide frames must be tackled in the old fashioned manner since there is no way to submerge them.

Only paint of controlled viscosity and gravity characteristics can be employed. More paint is floated on the water surface than is actually used to cover the section of the holder, but the excess is recovered, so that the net amount of paint used on a holder does not exceed the amount required by the brush method of painting. The paint is brought from the manufacturer to the job site in a tank truck. There it is pumped through temporary distribution lines to several points on the surface of the water in the holder cups. The paint must float from one to four inches in depth.

The holder lift to be refinished is then submerged to the full depth of the holder tank, the dry surface of the lift dragging a "curtain" of paint down with it. Pressure of water in the tank forces the paint to cover the surface of the holder lift completely and evenly. As the lift rises, surplus paint flows off to float again on the water surface, from where it is recovered to be used again.

Paint is recovered by a device which consists of a funnel whose lip is held just below the paint surface and well above the water surface. A suction hose at its base pulls the paint back into the tank truck. There it is checked for specific gravity and viscosity, the volatile loss is replaced and the small water content drained off at the bottom of the truck.

One of the Consolidated Edison gas holders which was painted by the flotation method.

L. B. Donovan, who developed the flotation method of paint application.

One of the many problems confronting the Painting Bureau while the new process was being developed was how to measure the depth of paint floating on the holder cup water surface. No known device would do the job, so an appeal was made to the Electrical Engineering Department which designed a successful one. A model was made by Alfred Veeck, tester of the Test Bureau. Mr .Veeck also volunteered a device of his own designing which was preferred because it was simpler and more rugged. It is a wooden mount which looks like an elongated yardstick, bearing a scale. Attached by guide wires is a weighted float which sinks through paint but rides flush with the water level. By noting the position of the float and then raising it to the paint surface a reading can be taken of the thickness of the paint.

The new idea for water sealed gas holder painting was born during the war when labor shortages were plaguing the Painting Bureau. The system has a total of 31 water sealed gas holders which require painting at regular intervals.

Following a hunch, Mr. Donovan dipped a panel through a thin layer of black paint floating on water in a bucket and noted happily that the paint dried smoothly and evenly on the surface of the panel. Since black was an undesirable color for gas holders and other colors available in

A "still" from the motion picture on the flotation method of painting water-sealed gas holders. The arrow points to the layer of aluminum paint floating on top of the surface of the water in the holder tank.

the shop refused to float, he asked a paint manufacturer for help.

Thus began a long inquiry into the qualities of paint, its viscosity, volatility and specific gravity characteristics. There followed a study of water pressures, time periods and effects of submersion. It was found that available grey paint, which was a preferred color, had too critical a balance so it was abandoned in favor of aluminum paint and more studies were undertaken. In the meantime the small relief holder at the Ravenswood plant had been successfully refinished by the flotation method, using black paint.

Finally an aluminum paint with the desired qualities was developed and, since the fall of last year, the flotation method of refinishing water sealed gas holders has been accepted company practice. So far only aluminum or black has been used, since suitable paints of other colors are still in the laboratory stage.

Even though the flotation method produces a superior protective film, the Painting Bureau plans to repaint gas holder lifts at two year intervals. It is expected that the high quality film will prevent all except a very small amount of corrosion in that time and thus almost no preparation of holder lift surface will be required before repainting. This contributes to a further saving in maintenance costs.

To date five gas holders have been painted by the flotation method. Four were with aluminum paint and one with black.

The experience gained indicates that the method results in a superior paint film and a job cost reduction of fifty per cent.

Con. Edison Co. Announces New Sales Appointments

Edward A. Holmberg has been made manager of the Appliance Promotion Bureau of Consolidated Edison Company of New York, Inc., according to an announcement by Brigadier General Ephraim F. Jeffe, vice-president in charge of sales. Mr. Holmberg takes the place formerly held by Dennis S. Melvin.

Mr. Melvin was transferred to the Purchasing Department as the result of his selection for the company's Executive Development Program, which is designed to give employes of executive calibre a broad training in company affairs so that they may qualify for higher posts.

Harry A. Sammond, formerly associate district sales manager, has been named assistant manager of the Appliance Promotion Bureau.

Thomas J. Collins has been made manager of the Showroom Division of the Appliance Promotion Bureau, in charge of showroom activities in 26 company locations throughout the service area.

Edward D. McOwan joins the Sales Department as assistant manager of the Dealer Division of the Appliance Promotion Bureau.

Miss Marion Seitz, formerly secretary to the chairman of the Executive Committee, has been named assistant manager of the Home Service Division of the bureau. In this capacity she will assist the manager, Miss Lucy L. Hanan, in organizing the division's program of lecture demonstrations to consumers in the five company Home Service Centers and to regular educational gatherings.

Dr. McCabe with Bureau of Mines

Dr. Louis C. McCabe, an authority on the mining, preparation and properties of coal, joined the Bureau of Mines staff on April 5 as chief on the Coal Division in the Fuels and Explosives Branch.

In his new position, with headquarters in Washington, D. C., Dr. McCabe will supervise the Bureau's research on the mining, preparation, carbonization, and gasification of coal and kindred subjects at the Bureau's experiment stations and pilot plants in various parts of the country. He comes to the Bureau from the American Gas and Electric Company of New York City, where he has been employed.

STAMANCO
Sign of ENGINEERING EXCELLENCE

The trade name "STAMANCO" stands for specialized experience . . . leadership in design . . . and finest quality workmanship. In fact, it epitomizes all those desirable characteristics that make for the highest degree of economy and satisfactory operation in gas holders, hi-pressure tanks, and purifiers. Photo at right shows an example of "STAMANCO" engineering excellence--one of our 750,000 cubic foot Wet Seal Gas Holders recently installed at Pittsfield, Mass. This is the FIRST All-Welded Gas Holder permitted to be erected in the State of Massachusetts.

Before you invest in such equipment, it will pay you to talk over your requirements with one of our engineers and get a bid on a "STAMANCO" quality job.

The STACEY MANUFACTURING Co.
SINCE 1851
CINCINNATI 16, OHIO
GAS HOLDERS • HI-PRESSURE TANKS • PURIFIER BOXES
ENGINEERS • FABRICATORS • CONSTRUCTORS
An Independent Organization Not Affiliated With Any Other Builders of Gas Holders

American Gas Association Activities

Home Service Booklets Issued by A.G.A.

Home Service A Career, a new green covered booklet prepared by the Home Service Committee of the American Gas Association, emphasizes the importance of gas company home service work as a job and as a career.

As a text book and reference it can be used in our colleges where students are in training for a career in home economics.

The text briefly outlines the story of home service—includes an overview of its activities, its qualifications and advantages. Gas companies will wish to make it available in their territories to colleges, home economics teachers in high schools and to students in training.

The booklet has been prepared by a subcommittee with Hulda Ungericht Wells of the Ohio Fuel Gas Company as chairman. Other members include Mary Belle Burnett, Cincinnati Gas & Electric Company, and Mildred Clark, Oklahoma Natural Gas Company. Price—10c a copy.

Modern Kitchens for Homemaking Instruction is the answer to frequent requests in the modernization of school laboratories where home economics is taught.

The arrangement and equipment convenient for teaching with special application to work in foods and related subjects is described. Gas equipment is featured.

This booklet supersedes one of the same title published in 1937. The earlier booklet served a need in considering the best equipment and most efficient working arrangements in the home economics class rooms of schools.

School authorities are keenly interested in plans for new buildings. In this booklet the Home Service Committee has incorporated new trends in homemaking instruction — new ideas in kitchen planning—specific consideration to the selection, use and teaching of equipment. It will contribute a working guide for the planning of new home economics class rooms or bringing existing ones up-to-date with modern gas equipment. Price 15 cents a copy.

New Mixed Gas Study Undertaken

Extension of recently completed mixed gas research studies on interchangeability of other fuel gases wtih natural gases to include manufactured gas as base load has been undertaken by the American Gas Association Testing Laboratories. This project is sponsored by the Gas Production Research Committee of which P. T. Dashiell, Vice-President in charge of Production of The Philadelphia Gas Works Company is Chairman and Edwin L. Hall is Secretary-Coordinator. It is under the supervision of a new Technical Advisory Committee on Mixed Gas Research.

The first meeting of the new Advisory Committee was held at the Laboratories in Cleveland on April 2. Mr. J. A. Anthes of Brooklyn Union Gas Company was elected Chairman.

A desk study and survey trip as a preliminary phase of the investigation was approved by the committee. This will include consideration of empirical interchange indices for base natural gases, presented in Bulletin No. 36 "Interchangeability of Other Fuel Gases with Natural Gases," for possible application to base manufactured gases.

As further preliminary, a survey of representative manufactured gas companies to secure first-hand information on actual operating problems encountered by them in mixing gases was approved. Procedures for producing and mixing gases, methods of gas analysis, types of critical appliances in general use and practices followed in adjustment of appliances will be studied.

Copies of bulletin 36 may be obtained directly from the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland 14, Ohio, at a cost of $2.50 each.

Members of the new Technical Advisory group besides Mr. Anthes are: W. E. Churchill, Boston Consolidated Gas Co., W. R. Fraser, Michigan Consolidated Gas Co., Detroit, F. E. Vandaveer, East Ohio Gas Company, Cleveland, and C. C. Winterstein, Philadelphia Gas Works Co.

Southwest Personnel Executives Meet

The twelfth meeting of the American Gas Association Southwest Personnel Conference held at the Rice Hotel in Houston, Texas, April 12, was well attended and the discussion of current employee relation matters most enlightening. In opening the meeting Chairman H. D. Carmouche of the Houston Pipe Line Company outlined the topics scheduled for discussion, the reasons for their inclusion and briefly outlined their significance. J. C. Flanagan, Vice-President of the United Gas Pipe Line Company, the originator of regional personnel conferences welcomed the group to Houston, stated its accomplishments exceeded anticipations and made some interesting comments on current industrial relations developments. Kurwin R. Boyes, Secretary of the American Gas Association reviewed significant developments in other sections of the Country for the information of the group. As usual each member present reported on developments which were discussed in detail. A committee consisting of V. H. Luneborg of the Arkansas Natural Gas Corporation and H. F. Taylor of the Oklahoma Natural Gas Corporation was appointed to arrange a joint meeting with the A.G.A. Midwest Personnel Conference at which an intensive course on the technique of contract negotiations will be conducted.

To Promote Commercial Gas

John J. Bourke has been appointed Promotional Assistant for Commercial Gas under the Promotional Director of the American Gas Association according to an announcement of H. Carl Wolf, Managing Director.

Underwood & Underwood
John J. Bourke

Mr. Bourke wil lengage in promotional activities in the Hotel, Restaurant and Institutional field on commercial cooking and baking. He will work with consumers and consumer groups seeking to protect and increase present gas loads and develop new ones. In carrying on this activity he will cultivate and maintain close working relations with leaders of organizations in the commercial cooking industry together with manufacturers of commercial gas-fired cooking appliances. He will also represent the American Gas Association at conventions, expositions and meetings in related activities and will also coordinate his efforts with those phases of the Industrial and Commercial Gas Section and its Food Service Equipment Committee.

Mr. Bourke comes to the Association with a background of experience in the restaurant end of the hotel business in which he engaged for some years following a course at the Lewis Hotel Training School, Washington, D. C., in Hotel Management. During the war, after graduating from the Army Air Force Officers' School at Miami Beach, Florida he was appointed Mess Officer and Post Food Supervisor at Stewart Field, Newburg, N. Y.

The High Pressure Gasification of Coal

By H. M. Weir
Philadelphia, Pa.

Continuous, rather than intermittent production of city gas, directly from solid fuel and at high pressure was commercial operation in at least two plants in Germany during the war period.

The Lurgi Gesellschaft had developed the process, largely in prewar days. The first commercial installation was at Böhlen, Saxony, and from late 1939 or early 1940 it supplied part of the gas from the nearby city of Leipsig. A second plant in Silesia started operations at a later date.

At Böhlen, the A. S. W. (Aktiengesellschaft Sachsiche Werks) used fuel in the form of roughly sized fragments of briquets from low temperature carbonization of Braunkohl. Braunkohl, after drying and sizing was itself often mixed in with the other fuel.

The 1 to 2 meter deep fuel bed in the generator was continuously blasted with a mixture of steam and oxygen, the latter produced by a nearby Linde-Frankl plant. The crude gas resulting contained some 30% carbon dioxide and was under some 18 atmospheres pressure. Appropriate cooling, removal of tar and distillate, followed by other purification under pressure produced gas under 18 atmospheres pressure and typical analysis:

Hydrogen	48-49%
Carbon Monoxide ..	22-24%
Methane	25-29%

Remainder, Higher Hydrocarbons, Nitrogen and Carbon Dioxide Heating Value, 4200-4300 k Cal/nM³

The fuel bed was replenished intermittently through operation of interlocking valves on a pressure withstanding vessel at the top, from which the solid dropped by gravity. Ash was continuously removed at the bottom by a special rotating grate which passed ash into a pressure-withstanding vessel not unlike that at the top. Operating of interlocking valves permitted the intermittent removal of ash from this container.

Details of the construction of the equipment and typical operation are given in the paper.

Abstract of paper presented at Annual Meeting of the American Chemical Society, Atlantic City, N. J., April 8-12.

Chemicals from Natural Gas

Science has only "scratched the surface" in the utilization of natural gas in the manufacture of synthetics, Dr. Harold Vagtborg, director, Midwest Research Institute, Kansas City, Mo., told members of the Interstate Oil Compact Commission April 13 at the closing session of its spring meeting.

Eighty-five organic chemicals have been listed by one company from natural gas, while another reports 71 products made from only isobutylene.

Typical components of natural gas, said Dr. Vagtberg, are methane 80-90 per cent; ethane 5-10 per cent; propane 3-5 per cent; butane ½ per cent, and pentanes and hexanes ½ per cent.

"Compared with the slower development of other industries, progress to date in this field is amazing when it is considered practically all of the 'know how' has been developed since about 1930," Dr. Vagtborg said. "Indicating the range of research yet open in the field of natural gas utilization, he pointed out that use of methane was chiefly for fuel because its use in synthetics was yet an unsolved problem.

For this reason many operators have geared operations to the extraction of propane and butane for chemical synthesis because they are the easiest used.

Phenol-formaldehyde resin, produced from formaldehyde processes from natural gas is one of the chief sources of new plastic industry. He listed articles made from this plastic, such as aircraft antenna loop housing, naval fire control instrument housings, hinges, oil well drilling equipment parts, furniture, boat sterns.

Ammonia, methanol and nitric acid were listed as other chemicals.

Dr. Vagtborg foresees the growth of new industrial empires for supplemental industries as the result of the manufacture of synthetics from natural gas.

This ability to interchange most forms of the nation's natural resources in the production of raw chemicals has increased the realization of the necessity of conservative use of such resources, he said.

New York-New Jersey Regional Gas Sales Conference

This Annual Sales Conference sponsored by the Residential Gas Section of American Gas Association was held at the Westchester Country Club, Rye, N. Y., on April 11-12.

James W. Carpenter, Vice Pres. of the Long Island Lighting Company, in the opening address spoke on the over-all sales objectives of the gas industry.

Frank McFerran, Ruud Manufacturing Co., chose as his water heating subject "The Big Share of the Business Belongs to Gas."

Charles W. Kimball, Cribben & Sexton Co., dealt with trends in national cooking. His address was titled "Who's Going to Do What to Whom."

An analysis of the appliance outlook, with emphasis on volume and new features, was presented by Harold Massey, assistant managing director, Gas Appliance Manufacturers Association.

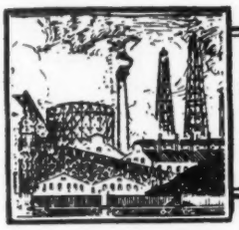
The second day's program included an authoritative analysis of financing plans by the chairman of the A. G. A. Appliance Financing Committee, H. W. Nichols, Rochester Gas and Electric Corp. His topic was entitled "We Must Make It Easy To Buy." Of special interest was an address on "What Price Dealer Participation" by H. S. Christman, chairman of the A. G. A. Committee on Dealer Relations and sales manager of The Philadelphia Gas Works Company.

W. J. Grover, Surface Combustion Corp., Toledo, Ohio, originator of the "Quick Getaway Plan," described latest developments in the all-gas merchandising program under the title "Capitalizing on the New Home Market."

A dinner meeting featured an address by Harry Simmons, sales consultant of New York City, on the topic "Peacetime Challenges to Management."

H. Carl Wolf, managing director, American Gas Association, concluded the conference with an up-to-the-minute account of the national research and promotional program.

J. J. Wholey, Rockland Gas Company, Spring Valley, N. Y., was chairman of the conference. His committee included W. D. Williams, Public Service Electric and Gas Co.; W. B. Hewson, The Brooklyn Union Gas Co.; C. A. Kennedy, New York & Richmond Gas Co., and F. W. Williams, American Gas Association.



News of the Gas Industry

Annual Meeting Southern Gas Association

The Southern Gas Association held its Annual Meeting at Galveston, Texas, March 21-22.

Vital theme of the convention was the enlarged and expanded program soon to be entered into by the Southern Gas Association under its new Managing Director, Robert R. Suttle.

One of the high lights of the convention was the paper entitled "The Functions of a Regional Gas Association" delivered by Mr. Clifford Johnstone, Managing Director of the Pacific Coast Gas Association. Mr. Johnstone stressed in his paper that regional associations are needed to prevent the clogging up of the national association machinery with purely regional matters. He stated that each region is faced with some distinct and individual problems, perhaps due to climate, natural resources or state regulation, which must be solved within the region. The regional association furnishes the machinery for such action. Mr. Johnstone further stated that the regional association is an organization in which the individual rank and file can get and give information, and become acquainted with the fellow who does the same work in the next town.

Plaques were presented to retiring President Frank S. Kelly, Jr., First Vice President Clayton L. Nairne, Second Vice President John H. Warden and Secretary-Treasurer, L. L. Baxter in recognition of their services to the Association. Mr. Kelly, Mr. Nairne and Mr. Warden have completed two years of service in their respective offices and Mr. Baxter completed six years of service as secretary-treasurer.

The following officers were elected:

President—Dean A. Strickland, Gen. Sales Mgr., United Gas Corp., Houston, Texas.

First Vice President—W. L. Woodward, President, Zenith Gas System, Alva, Okla.

Second Vice President—W. H. Ligon, President, Nashville Gas & Heating Co., Nashville, Tenn.

Treasurer—L. L. Dyer, Comptroller, Lone Star Gas Company, Dallas, Texas.

An office for the Association has been established at 1011 Burt Building in Dallas, Texas.

Indiana Gas Association

The advance program of Indiana Gas Association Annual Meeting to be held at French Lick Springs, May 9-10 includes the following papers and addresses.

"New Problems—New Opportunities": H. Carl Wolf, Managing Director, American Gas Association.

"Trends in Utility Regulation": Hon. Leroy E. Yoder, Chairman, Public Service Commission of Indiana.

"Challenges to The Gas Industry": Walter C. Beckjord, President, Cincinnati Gas & Electric Company.

"Automatically Yours,": E. Carl Sorby, Vice-President, George D. Roper Corporation.

"Looking Ahead in Personnel Relations": Howard Dirks, Personnel Manager, Perfect Circle Company, Hagerstown, Indiana.

"The Gas Business—Its Future": Frank C. Smith, President, Houston Natural Gas Corporation.

"What About Us In Indiana?": F. B. Culley, Vice President, Southern Indiana Gas & Electric Co., Evansville, Indiana.

"Old Diplomacy and The New Bomb": Dr. Louis M. Sears, Professor of History, Purdue University, Lafayette, Indiana.

85 Appliance Dealers and Plumbers Graduate

The Institute of Gas Heating Industries of Southern California held graduation exervices at the Mayfair Hotel, Los Angeles, March 14 at which certificates were presented to 85 gas appliance dealers and plumbers who completed the training course in the Gas Appliance Installers and Servicemen's School sponsored by the institute.

The Institute initiated a program in the spring of 1945 under which it undertook to train appliance dealers in the proper method of installing and repairing all types of gas appliances. The Southern California Gas Company collaborated by supplying the instructors and providing meeting places for the classes.

The first class, which contained 50 heating contractors and heating company employees and appliance dealers, was presented with certificates representative of their completion of the course, at exercises in the Mayfair Hotel on June 5, 1945.

The success of that initial class prompted the Institute to sponsor a second course for which the eligibility was broadened to admit plumber-dealers, plumbing contractors and journeymen. In this course the fundamentals of heating equipment and its operation was taught both by lecture and actual practice with controls and other equipment.

The current year's classes, which began January 14 and concluded March 8, were taught by Robert McKee and Paul Speers, dealer training representatives of the Southern California Gas Co., both of whom are members of the Institute. Mr. McKee recently left the gas company's employ and is now with General Water Heater Corp. Burbank, Calif.

Indicative of the favor the training classes have won in plumbing circles, 18 of the 85 graduates, or 21.2 per cent, were plumbers, and the balance heating contractors and appliance dealers and their employees.

CONVENTION CALENDAR

May

7–8 *A.G.A. Natural Gas Department,* Annual Spring Meeting, Cincinnati, Ohio, Gibson Hotel

7–9 *National Association of Corrosion Engineers,* Annual Meeting and Convention, President Hotel, Kansas City, Mo.

9–10 *Indiana Gas Assn.* Annual Meeting French Lick Springs, Indiana.

17–24 *International Petroleum Exposition,* Tulsa, Oklahoma.

21–23 *Pennsylvania Gas Assn.* 38th Annual Meeting, Wernersville, Pa., Galen Hall.

22–23 *Natural Gas & Petroleum Assn. of Canada,* Windsor, Ont.

25–29 *National Association of Master Plumbers,* Atlantic City.

June

3–5 *American Gas Association Joint Production and Chemical Committee Conference,* Hotel Pennsylvania, New York.

6 *American Gas Association* Midwest Personnel Conference, Kansas City.

11–12 *Gas Appliance Manuf. Assn.* Annual Meeting, Drake Hotel, Chicago.

18-21 *Canadian Gas Association,* 39th Annual Convention, Manoir Richelieu Hotel, Murray Bay, P. Q., Canada.

October

7–11 *American Gas Association,* Annual Meeting, Atlantic City, N. J., Convention and Exhibition.

W. C. Philpot Retires from Consumer's Gas Company

Wilfred C. Philpot is retiring from the Consumers' Gas Company of Toronto, Works Superintendency, after a leave of six months absence, beginning March 31st, 1946. Mr. Philpot also resigned as Vice-President of the Canadian Gas Association, and will take on a much-needed rest. He took an active interest in the Canadian Gas industry over the many years he was associated with it, and contributed a number of valuable papers to the C.G.A. Conventions.

A. G. A. at Restaurant Exposition

The Industrial and Commercial Gas Section of the American Gas Association sponsored the Commercial Gas Cooking Center at the 27th Annual Exposition of the National Restaurant Association, Hotel Stevens, Chicago, March 26, 27 and 28, 1946.

For three days the aisles were thronged with owners, operators, and chefs of restaurants, institutions, hospitals, clubs, together with jobbers and dealers in restaurant appliances and supplies. The nearly 15,000 visitors set a new record for attendance, and their interest in all the exhibits reached a new high. The one thought uppermost in the minds of all was to buy and buy, new equipment, replacement equipment, and to restock their depleted supply of restaurant essentials.

All types of gas fired cooking equipment were on display, as well as the gas fired kitchen accessories such as warm tables, dishwashing machines and glass sterilizers. Among the gas appliance manufacturers exhibiting, and those manufacturers whose appliances use gas as the heating medium were:

American Stove Company
G. S. Blodgett Company
Champion Dishwashing Machine Co.
Cleveland Range Company
Detroit-Michigan Stove Company
Doughnut Corporation of America
Duke Manufacturing Company
Groetchen Manufacturing Company
Lofstrand Company
Lyons-Alpha Products Company, Inc.
Royce L. Parker, Inc.
J. C. Pitman & Sons Sales Corp.
Robertshaw Thermostat Company
Savory Equipment, Inc.
Silex Company
A. O. Smith Corporation
Standard Gas Equipment Corporation
John Van Range Company

The meetings of the National Restaurant Association covered a wide range of subjects having to do with equipping and managing restaurants and other mass feeding operations. Emphasis was placed on the preparation of foods in quantity under the conditions existing today, and the changing eating habits of America.

Philadelphia Electric Earnings Establish New Record

Operating revenues of the Philadelphia Electric Company for 1945 exceeded $100 million dollars for the first time in the Company's history, Horace P. Liversidge, president, recently stated.

The Company's gas business, which is about 10 per cent of the total, and because of the highly-diversified industrial, commercial, and residential market in the Philadelphia area, had less difficulty than many other areas in moving from peace to wartime production; and likewise it has suffered less dislocation in re-establishing the peacetime basis.

With the gradual resumption of normal peacetime activities, it is expected there will be a growing market for the Company's services in all classes of the business.

New Jersey Power and Light Co. Reports Sales Increase

In the annual report of the New Jersey Power & Light Company for 1945, President H. C. Thuerk stated that the company sold greater quantities of electricity and gas than in any previous year in its history. The end of World War II brought about a reduction in sales to large power customers, but the residential and commercial business in the last quarter of the year showed a marked increase over 1944. Many commercial establishments and small industries renewed operations, and several new enterprises have moved or are planning to move into the Company's service area.

According to surveys completed in our service area in the Fall of 1945, the prospects for additional business in 1946 are encouraging. In anticipation of this and to reinforce present physical facilities the Company has begun a major construction program.

Operating revenues were the highest in the Company's history. New peaks were also reached in the sales of 297,800,000 kilo-watt-hours of electricity and 282,200,000 cubic feet of gas.

Meter Reading Accuracy

Prizes based on accuracy in meter reading were awarded by Peoples Gas Light and Coke Company, Chicago, at a recent dinner meeting sponsored by the Safety Section.

During 1945, sixteen men read 541,900 meters without making an error and, 82,744 readings were taken by three men who each made but one error. The prize money distributed amounted to $777.50. The combined total readings for those in the no error group was 2,066,015. Total accuracy for readings during the year by the entire department was 99.86 per cent.

The ace meter reader of all time, is William Morgan, whose record consisting of 12 consecutive years of reading gas meters without a single error is outstanding in the annals of Chicago public utility history. During the 12 year period he read 358,552 meters. Bill received $135 for his achievement. Harold Gustafson has a 7 year faultless meter reading record and received $85. Wilbur Haase came next in line for honors with a 6 year accuracy record.

Cities Service Gas Plans $25,000,000 Pipeline

Cities Services Gas Co. will construct a $25,000,000 pipeline from Kansas City to the Hugoton natural gas field in Western Kansas in 1947.

S. B. Irelan, of Oklahoma City, president of the company, announced April 12th that the 26-inch line, 405 miles long, will be the largest project ever undertaken by the firm.

The line will deliver 290,000,000 cubic feet of gas a day to the Kansas City area, increasing the total volume there about 50 cen cent on peak delivery days, the company reported.

Rate Reductions in Chicago

The Peoples Gas Light and Coke Company states in their publication *Gas News* that since the first of January, 1943, the company has made three rate reductions ordered by the Illinois Commerce Commission. The first one in February, 1943, amounted to $3,441,000 per year. The second reduction was made in January, 1946, and amounted to $438,000 and the present reduction which amounts to $2,000,000 and is effective May 1.

A very substantial part of this new reduction of $2,000,000, has been applied to some 810,000 residential customers in our various classification of rates. The percentage of reduction in such a customer's monthly bill naturally varies with the amount of gas consumed. However, the average consumption of these 810,000 customers is 12.8 therms per month and the reduction on this average consumption amounts to 7.3 per cent.

Under these new rates the cost of 12.8 therms is $1.90 per month as against $2.05 under the rates previously in effect.

Since the beginning of the war period, the cost of nearly every service and commodity in the country has shown an increase. This is not true of the cost of gas to the Chicago consumer. In fact, the reverse has been true due to the rate reductions during that period.

Since February, 1943, to January 1, 1946, there has been a total cumulative reduction in the cost of gas to the Chicago consumers of over $10,000,000.

Beginning May 1, 1946, after giving effect to the third rate reduction, the annual cost of gas to Chicago consumers will be $5,879,000 less per annum than in the first full years this country was at war, viz. 1942.

Interest Renewed in Charles A. Munroe Award

With the return of the gas utility industry to full peace-time activities, proposals for consideration for the Charles A. Munroe Award of the American Gas Association, are expected to cover a widely diversified field of accomplishments, Clifford E. Paige, Chairman of the Award Committee, and President of The Brooklyn Union Gas Company, declared recently.

The basis of the Charles A. Munroe Award, which comprises an engraved certificate and a substantial cash award, is the value of a contribution to the advancement of the gas industry judged on its own merits and without regard to the occupational standing of the candidate. Awards have been made to engineers, accountants, plant engineers and other industry employees who never sought recognition or glory. National or industry-wide fame in no way is a requisite for consideration, Mr. Page stated.

Applications for consideration by the Award Committee may be submitted at any time to the American Gas Association Headquarters until August 1, 1946. No applications received after that date will be considered.

Holden of Dodge Corporation Views Building Obstacles

F. W. Dodge Corporation, fact-finding organization for the construction industry, states that on the basis of a survey conducted among top executives of the nation's leading building materials and equipment producers, that the industry's goal of full production has been stymied by inadequate price ceilings, strikes directly and indirectly affecting production in plants and factories, inadequate manpower, inefficient manpower, inadequate raw materials, and inadequate supplies other than raw materials.

"The situation is such," Thomas S. Holden, president of the Dodge corporation, declared, "that unless current price adjustments are adequate to insure reasonable profit, and unless the manpower situation is corrected and labor efficiency improved in the near future, the industry will be unable to carry out the veterans' housing program and other essential construction on the scale expected or on a scale the industry has the potential capacity to achieve.

"While recovery in the industry has been marked since the end of the war," Mr. Holden said, "and has been at a rate in excess of expectations, much of the impetus has come through the willingness of producers to market materials and equipment in anticipation of price adjustments, and through the willingness of investors to pay premiums to builders sufficiently high to guarantee all contingencies involving expensive substitutes, delays and hardships in supply procurement, and higher labor costs."

Government regulations, particularly administration of the Price Control Act is cited as the chief bottleneck of production by producers of such materials and equipment as masonry products, wood, metal products, glass, roofing and siding, heat insulation, wallboard, floor and wall materials, paints and finishes, doors, windows, hardware, sanitary equipment, water supply and drainage, electrical distribution, air conditioning and heating.

Some producers have already discontinued nonprofitable lines, among them roofing, siding, heat insulation materials and hardwood. The Wyatt program restricting nonresidential construction has been of deep concern to many manufacturers, particularly in the heating and hardware fields and among manufacturers of building stone and cement.

Rockwell Acquires Ross Stock

Purchase of The A. H. Ross Company, Manufacturers of packaging machinery, by Rockwell Manufacturing Company, Pittsburgh, has been announced by Colonel Willard F. Rockwell, Chairman and President.

A. H. Ross, President and principal stockholder of the Ross Company will become Vice President and General Manager of the packaging machinery division of Rockwell, but the company will continue to operate under the name of A. H. Ross Company and maintain its plant located in Ludlow, Kentucky.

James F. Bell Appointed to Portland Gas & Coke Staff

Appointment of James F. Bell as assistant to the president of Portland (Ore.) Gas & Coke Company fills a vacancy created by the recent election of C. H. Gueffroy as a vice president, according to an announcement by President Paul B. McKee.

Bell served two years in the navy and as a lieutenant was radar officer aboard the destroyer *Stormes* in the Pacific. A Stanford University graduate in civil engineering in 1932, he took post-graduate work at the University of Munich for two years. He then accepted a position with the United States Smelting, Mining & Refining Company in Bingham Canyon, Utah. Later he spent two years at Harvard and M.I.T. on a national research council project.

In 1939 he joined the research division of the Consolidated Gas, Electric Light & Power Company of Baltimore. He remained there until 1942 when the war production board sent him to Brazil as chief engineer on a mission to procure quartz crystals and mica for important war needs. It was there that he met McKee who also was on the mission as head of the United States purchasing commission in Brazil.

Bituminous Coal Research Appoints Westerberg

Bituminous Coal Research, Inc., national research agency of the bituminous coal industry, has announced the addition of Carl S. Westerberg, Webster Groves, Mo., to its Pittsburgh office staff. The appointment is effective at once. Westerberg succeeds Ralph H. Hopp, who resigned last year to become librarian of Battelle Memorial Institute, Columbus, O.

A former employee of Utah Fuel Company, Salt Lake City, Utah, and the Illinois-State Geological Survey, Urbana, Ill., Westerberg, has been engaged in bituminous coal activities since he was graduated from Knox College, Galesburg, Ill., in 1931, where he received a Bachelor of Science degree after having majored in chemistry.

Effective May 1, the administrative offices of Bituminous Coal Research, Inc., national research agency of the bituminous coal industry, will be moved from 719 Oliver Building to 912 Oliver Building, Pittsburgh 22, Pa.

Approval Requirements Committee Adopts New Standards

The A.G.A. Approval Requirements Committee, meeting at the Laboratories on March 15, approved revisions to hotel range and deep fat fryer requirements previously distributed to the industry for criticism. They were adopted as addenda to present requirements and distributed in mimeographed form to all interested manufacturers. They become effective January 1, 1947, at which time recently distributed requirements covering high altitude approval for several other types of appliances also become effective.

It was decided by the committee that separate listing in the Directory of Approved Gas Appliances and Listed Accessories published by the Laboratories will be made of appliances approved for high altitude use. An additional section under an appropriate heading for each type of appliance so approved will follow immediately after the respective regular section in the Directory.

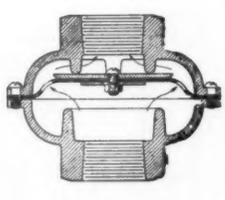
At this meeting the committee adopted a new draw-off test for automatic storage water heaters of the internal type to insure delivery of an adequate supply of hot water under extreme conditions of use. It also authorized preparation of listing requirements for porcelain-enameled water heater tanks, the basis for the new requirements to be Commercial Standard 115-44 issued by the National Bureau of Standards.

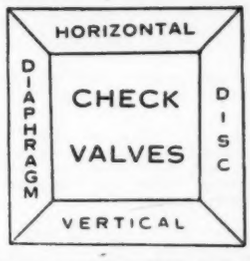
The A.G.A. Approval Requirements Committee is a Sectional Committee, Project Z21 of the American Standards Association.

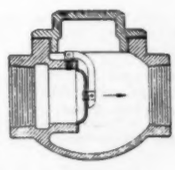
Ramsey Manager, Hamburg Gas Co.

Charles H. Ramsey who has been associated with the Pottsville Gas Company, Pottsville, Pa., as manager in charge of the sales department has been given a promotion to the office of manager in charge of the Hamburg Gas Company. Mr. Ramsey has been associated with the gas company for the past 20 years and is a discharged veteran of World War 2, having served four years with the armed forces.

Pressure Controls for Gas and Air







NORWALK VALVE DIVISION, ALLIED CONTROL VALVE COMPANY

35 Railroad Ave. South Norwalk, Conn.

McGowan Lists Promotions in United Gas Companies

Filling of several key positions in the United Gas organization by promotion of veteran officials was announced recently by N. C. McGowen, president of the United Gas Companies.

L. V. Tracht, assistant secretary and treasurer of the operating division of United Gas Corporation in Houston, a veteran of more than 20 years in the utility field, has been appointed treasurer of the United Gas Corporation and associated companies.

R. E. Hull, auditor of the United Gas Pipe Line Company, has been appointed comptroller of the same group.

Other changes announced by Mr. McGowen move well known United Gas officials into more important positions. J. H. Miracle has been appointed secretary of United Gas Corporation and associated companies. F. E. Waltrip becomes general auditor of United Gas Corporation and associated companies. H. W. Egger has been named superintendent of compressor stations to succeed A. L. Bradford, recently retired after long service. M. V. Cousins has been appointed director of personnel, a reorganized departemnt to include personnel, insurance and safety departments and publication of United Gas Log. D. R. Pflug has been made assistant chief engineer of United Gas Pipe Line Company, succeeding W. J. Parkes, retired. H. W. Eiser has been appointed superintendent of transportation of United Gas Pipe Line Company, Union Producing Company and United Oil Pipe Line Company, a newly created department to include automotive as well as all other forms of transportation.

Pflug Named Vice President

J. Lynn Pflug, formerly of Atlanta, Ga., was recently appointed vice president of the South Atlantic Gas Co., according to Pres. Hansel Hilyer.

Pflug came here from Atlanta, where he was a partner in the public accounting firm of Kaskin and Sells.

Ruud Mfg. Co. Adds to Field Representatives

The Ruud Manufacturing Company of Pittsburgh, Pa., has added R. M. North and T. T. Smith to their growing list of direct-factory representatives throughout the country.

Returning to the Ruud roster after a long session against the Japs in the Pacific as a Navy PT Boat skipper, ex-Lieutenant R. M. North will return to his pre-war Indiana territory with headquarters in Fort Wayne.

T. T. Smith, appointed representative for Georgia, Alabama, and Tennessee, will base his operations in Atlanta, Ga. He comes to Ruud from wartime service in Atlanta with the Office of Price Administration. No stranger to this area, he was long associated with several Georgia gas utilities and just prior to the war was Sales Manager of the Macon Gas Company.

A. E. Gauer, President B. C. Electric Railway Co.

Dr. A. E. Gauer has been appointed president of the B. C. Electric Railway Company at Vancouver, B. C., succeeding W. G. Murrin, who resigned at the annual general meeting of the company April 25. Dr. Gauer was appointed as president at a meeting of the Board of Directors immediately following.

Dr. Gauer is the youngest president in the history of the company, being born in Vancouver, January 21, 1906. He graduated with first class honors in Economics and History from the University of British Columbia in 1925.

Following graduation in British Columbia, Dr. Gauer received his Ph.D. in Economics and Political Science at the University of California, and as a Rhodes Scholar from Vancouver he won further degrees in Jurisprudence at Oxford. He returned to Vancouver and practised law in 1930 and 31 and then joined the faculty of the University of Toronto.

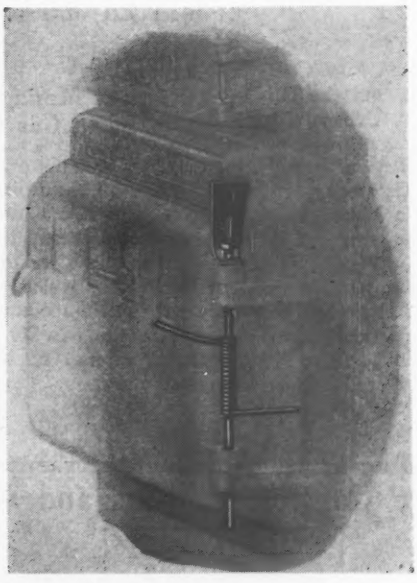
From the middle of 1931 until he was subsequently appointed vice-president of the B. C. Corporation, Dr. Gauer was general secretary of the B. C. Electric Railway Company. He was particularly in charge of Public Utility Commission data and of rate and wage hearings.

Mr. W. G. Murrin, retiring president of the company, has held that post for many years and prior to that was vice-president under the presidency of George Kidd.

THE INLAND DOOR CLOSER

DESIGNED for CONVERSION BURNERS

OVER 50,000 IN USE



This device, designed for conversion burners, automatically closes the fire door of a boiler or furnace when blown open.

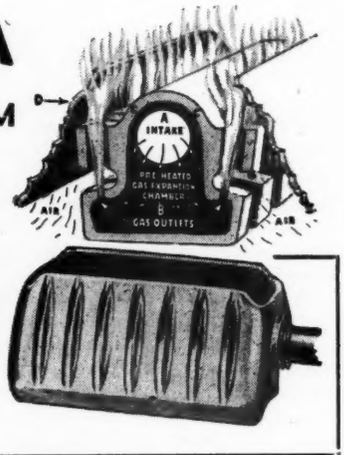
It consists of a cadmium plated door hinge pin, spring and wedge. The hinge pin replaces the regular fire door pins, the spring furnishes the motive power and the slotted wedge holds the fire door in the open position when required.

Furnished in 3/16 — ¼ — 5/16 — ⅜" Sizes

INLAND MANUFACTURING CO.
1120 N. Cicero Avenue, Chicago, Ill.

COLUMBIA
LITTLE GEM
GAS BURNER

A small unit which may be used singly or in series. Each unit 6½ in. long x 4 in. wide. Wide application of domestic and commercial uses. May be used in round or square steam or hot water boilers, warm air furnaces, Arcola type heaters and circulating heaters. Used commercially for heating tanks, boilers, ranges, ovens, etc. Natural, manufactured, or mixed gas. Complete combustion without pre-mixing. Write for circular.



COLUMBIA BURNER CO.
729 Ewing Street
Toledo 7, Ohio

GPM
IRON HYDROXIDE

The mark of unerring dependability in purification

GAS PURIFYING MATERIALS CO., INC.
3-15 26th Ave.
Long Island City 2, New York

Kansas-Nebraska Natural Gas Co. Will Expand Facilities

The Federal Power Commission has granted authority to the Kansas-Nebraska Natural Gas Company, Phillipsburg, Kansas, to construct, acquire and operate gas transportation facilities in Kansas and Nebraska at an estimated cost of $1,575,000. According to the company's application, the construction work will be commenced immediately.

The program authorized will enable the applicant to obtain adequate volumes of gas from the Hugoton Field and discontinue the receipt of gas from the Kansas Power and Light Co. It will also provide greater delivery capacity to meet increased demands of the company's present customers and also to supply new markets in Kansas and Nebraska.

The Commission's authorization includes the following:

1. Construction of a new 1,000-horsepower compressor station near Palco, Kansas.

2. Installation of a 1,000-horsepower compressor unit and auxiliary equipment at an existing compressor station near Scott City, Kansas.

3. Removal of a 500-horsepower compressor station near Traer, Kansas, to the vicinity of Colby, Kansas.

4. Removal of three 450-horsepower units from the Scott City Compressor Station and their installation at a new compressor station in the Hugoton gas field near Deerfield, Kansas.

5. Laying of approximately 56 miles of 16-inch and 21 miles of 12¾-inch pipeline extending from the company's existing pipeline near Phillipsburg, Kansas, to a junction with an existing pipeline near Hastings, in Adams County, Nebraska.

6. Replacement of approximately 56 miles of 16-inch line extending from a junction with an existing line in Hamilton County, Nebraska, and terminating at a point in Thayer County, Nebraska, with pipe of smaller diameters.

"The History of Cooking" Booklet by American Stove Co.

A new educational booklet, titled "The History of Cooking," has been produced by the American Stove Company, manufacturer of Magic Chef gas ranges, and is now available to schools, home service departments, retail training meetings, etc.

The booklet, which includes 52 illustrations, tells colorfully and in a fast-moving fashion, the evolution of the American kitchen, the history of the gas range, and the narrative record of gas as a fuel. It was prepared in collaboration with the publication, "What's New In Home Economics."

"The History of Cooking" makes an ideal educational piece and is expected to prove of especially great service to domestic science departments of schools and colleges and cooking school demonstrators. It is being distributed through gas company offices and individual Magic Chef dealers.

Wilputte Coke Ovens Now Operating at Indianapolis

The new battery of 47 Wilputte Underjet, High and Low Burner, Coke Ovens at Indianapolis was placed in operation on April 4th. The contract was let by the Citizens Gas and Coke Utility in January, 1945, to the Wilputte Coke Oven Corporation, 40 Rector Street, New York, N. Y.

After the installation of temporary conveyors and bins to supply coal to the larry of a distant battery, demolition of the old battery was started on April 23, 1945.

The new ovens are equipped to be underfired with lean gas generated in a new Semet Solvay Engineering Corporation producer gas plant built for this purpose.

Propane Decarbonizing of Reduced Crudes

With oil refiners today facing a more competitive market than at any time in the history of that industry, there is need for large and small companies to undertake long-range planning of all phases of refinery operation, says the feature article in a recent issue of the *Kellogg-gram,* published by The M. W. Kellogg Company, petroleum engineers, of Jersey City, N. J. and New York, N. Y.

The writer states that the modern version of Propane Decarbonizing merits serious consideration among refiners interested in improving their overall operations. The article describes how this decarbonizing of feed stock improves the economics of catalytic-cracking through providing an economical way of taking the asphalt out of the crude by the use of a solvent.

Reviewing the history of propane decarbonizing, the writer states that this method was developed as a result of increased knowledge gained in developing propane deasphalting units for refining lubricating oils.

"The discovery years ago that asphalt separation occurred when petroleum was mixed with propane introduced a radically new principle to oil separations—that of 'bottoming' in contradistinction to topping. For propane deasphalting and propane decarbonizing are the exact reverse of distillation in that the highest boiling component of a mixture is separated *first.*"

"Instead of relying upon a difference in boiling points, these Propane processes effect the separation of asphalt by a difference in solubilities and at temperatures below 200°F. The asphalt separation is cleaner and sharper than can be secured with vacuum distillation, and the fact that it is achieved at low temperature means that absolutely no thermal cracking occurs; thus the decarbonized or deasphalted oil is truly a virgin stock even to the highest boiling material included."

Roberts & Mander Corp.

The business heretofore conducted by Roberts & Mander Stove Co. at Hatboro, Pa. is now carried on under the name of Roberts & Mander Corporation. Henry S. Minster is President.

N. B. Nichols Joins Taylor Research Division

The Taylor Instrument Companies announce the appointment of N. B. Nichols as Director of its Research Division. He succeeds Dr. H .L. Mason who resigned to accept the professorship of Mechanical Engineering at Iowa State College, Ames, Iowa. Mr. Nichols has, for the past four years, been associated with the Radiation Laboratory, Cambridge, Mass., a subsidiary of the Massachusetts Institute of Technology.

N. B. Nichols

The Taylor Research Division has for many years carried on industrial research and development and it is the policy of the company to continue the expansion of this type of work. Mr. Nichols will accordingly be charged with the supervision of a large variety of scientific projects leading to the development of new products for use in both home and industry.

National Radiator Co. Acquires New Plant

The National Radiator Company, Johnstown, Pa., has purchased the Pullman-Standard Car Company plant at Middletown, Pennsylvania, it was announced recently by Robert S. Waters, president. The plant will fabricate steel boilers for industrial and domestic purposes, pressure vessels, heat exchangers and other industrial products, formerly made at the firm's Lebanon plant. The company's other five plants are located at Johnstown and New Castle, Pennsylvania, and Trenton, New Jersey.

The Middletown property has upwards of 300,000 square feet of floor area which will allow the company to increase its production of equipment used in the heating, chemical, petroleum and processing industries. The entire plant will not be put into operation at once due to needed reconversion. When working full capacity it will employ in the neighborhood of 1,500 people.

Research, Engineering Staffs Coordinate Nordstrom and Edward Valve Developments

The Engineering and Research staffs of the Nordstrom Valve Company and Edward Valves, Inc., have been pooled to give impetus to their product development program.

Both affiliated with the Rockwell Manufacturing Company of Pittsburgh, the two companies for years have maintained extensive Engineering and Laboratory staffs carrying out independent programs. In a recent meeting at the Edward Plant, executives of the Sales, Engineering and Research staffs worked out a long-term program which keeps the advantages of separate operations with extensive exchange of technical design and research data and summaries of investigations.

"We are doing valve design and research at three of our plants," explained W. F. Rockwell, Jr., Vice President and General Manager of the Rockwell Manufacturing Company, who conducted the meeting. "The Pittsburgh, East Chicago and Oakland, California Plants have been assigned specific projects best suited to the facilities and personnel of each plant.

"This procedure permits us to greatly speed up development programs and to undertake research projects of a scope too wide for the ordinary individual industrial Laboratory. Periodic meetings will enable us to make progress reports and bring the combined experience of three Engineering organizations to bear on the problem."

Within the three plants several hundred projects are now underway. Included are investigations of new metals and lubricants, developments in flow engineering, new manufacturing techniques and adaptability of both Nordstrom and Edward Valves to new services and processes.

COORDINATED NORDSTROM AND EDWARD VALVE RESEARCH AND DEVELOPMENT

Rear Row (Left to Right)—E. E. Matheson, Sales Manager, Nordstrom Valve Company; A. J. Kerr, Vice-President of Sales, Rockwell Manufacturing Company; E. E. Hedene, Chief Engineer, Oakland Plant, Nordstrom Valve Company; W. F. Rockwell, Jr., Vice President and General Manager, Rockwell Manufacturing Company; C. B. Johnson, Chief Engineer, Pittsburgh Plant, Nordstrom Valve Company; W. A. Marsteller, Vice President, Edward Valves, Inc.; David MacGregor, Chief Engineer, Edward Valves, Inc.; W. F. Crawford, President, Edward Valves, Inc.

Front Row (Left to Right)—G. F. Scherer, Director of Research, Nordstrom Valve Company; L. H. Carr, Director of Research, Edward Valves, Inc.

41 Percent Increase in Natural Gas Planned for St. Louis Area

The St. Louis area would receive a 41 per cent increase in natural gas under a $11,540,000 expansion program announced April 5th by the Mississippi River Fuel Corporation.

The program, which would make an additional 48,000,000 cubic feet of natural gas per day available, is subject to the approval of the Federal Power Commission. It would be sufficient to enable the Laclede Gas Light Company, which mixes natural gas with artificial gas for resale to consumers, to convert to straight natural gas, Ben C. Comfort, President of Mississippi River Fuel, said.

A spokesman for Laclede Gas would not comment on the development other than to say that the company is studying the entire problem of conversion to straight natural gas.

The expansion program calls for construction of 265 miles of pipe line to supplement the present 430-mile line from the Monroe, La., gas field to St. Louis. The Carthage, Tex., field would be drawn on to supplement the present line.

The program also calls for a new pipe line across the Mississippi River at Ste. Genevieve, Mo., and construction of a smaller, auxiliary line across the White River Valley as a safety precaution against interruption of service by floods.

Heating and Air Conditioning. Describing their "Superfex" unit for home heating and air conditioning, Perfection Stove Company, Cleveland 4, Ohio, has issued folder R226. This unit employs a three stage burner which automatically delivers gas heat in proportion to weather requirements. Equipped with automatic humidifier and special burner and blower. It is shipped completely assembled. Bulletin on request.

Have you considered a
CHECK-UP
of
GAS PLANT PERFORMANCE
Investigations and Reports
by Qualified Engineers
COAL CARBONIZING COMPANY
314 North Broadway
St. Louis 2, Mo.

CONNELLY IRON SPONGE

High in efficiency . . . low in cost. In hundreds of plants throughout the country, Connelly Iron Sponge has proven itself . . the finest purification material on the market. Not only does it lower your purifying cost but its high activity and capacity tends to reduce distribution and service complaints because of the cleaner gas which ultimately lowers operating and maintenance costs

If you have a problem in gas purification, Connelly's 68 years of experience is at your service. Our engineers can help you . . . there is no obligation on your part.

CONNELLY IRON SPONGE & GOVERNOR CO.
ELIZABETH, N. J. LOS ANGELES, CALIF
3154 SOUTH CALIFORNIA AVE., CHICAGO 8. ILL.

Annual Convention of the Canadian Gas Association

This coming 39th annual Convention of the Canadian Gas Association to be held at Hotel Manoir Richelieu, Murray Bay, Quebec on June 19-21 promises to eclipse the successful meeting of a year ago.

Reservations are rapidly approaching the saturation point of 400 with upwards of 360 delegates already registered.

R. M. Perkins, Chairman of the Papers and Speakers' Committee, and Mr. A. J. Strain, Chairman of the Entertainment Committee, and the members of these respective committees have been working hard towards producing a programme that will make this particular meeting one of the most outstanding of the Association's long history.

Mr. Perkins has given a partial list of speakers and their subjects:—

"Vapor Phase Gum Problem as it Relates to Filters," by H. D. Lehman, Manager, Customers' Service Department, Philadelphia Gas Works Company, Philadelphia, Pa.

"Gas Industry Progress and Some Whys and Wherefores of House Heating," by Hall M. Henry, Director Gas Operations, Negea Service Corporation, Cambridge, Mass.

"Some Experience With Gas House Heating in a Canadian City," by P. W. Geldard, Assistant Engineer of Distribution, The Consumers' Gas Company of Toronto, with "Supplement" by J. A. Morrison, Supervisor of the Laboratory, Consumers' Gas Co., of Toronto, to cover "Investigation of House Heating Complaints."

"Accomplishments of the Gas Industry in Canada During the War," by Edward J. Tucker, Vice-President and General Manager, The Consumers' Gas Co., of Toronto, Toronto, Ont.

"Appliance Standardization" by S. B. Severson, President, Dominion Natural Gas Company Ltd., Buffalo, N. Y.

"Uses of Propane in the Gas Industry," by B. C. Blizzard, Manager, Liquefied Gas Department, Imperial Oil Limited, Toronto, Ontario.

The Guest Speaker at the Association's Annual Banquet will be Mr. E. Carl Sorby, Vice-President, Geo. D. Roper Corp., Rockford, Illinois. His subject will be one that can be looked forward to with a great deal of expectancy by all who participate in this event.

The Gas House Club features and the many features promised for the ladies of the party, with many attractive prizes, will also be of an outstanding order. The Golf Tournament promises much, with the likelihood of over 100 delegates taking part. The Murray Bay Golf Links are unsurpassed.

Those who intend going should notify Mr. G. W. Allen, Executive Secretary, as soon as possible. Address 7 Astley Ave., Toronto 5, Ontario.

Canadian Notes

Northwestern Utilities, Limited, intends to build a natural gas pipe line about 106 miles in length to serve Camrose, Wetaskiwin, Ponoka, Lacombe and Red Deer. Distribution systems will be built in all of these places. In addition to this the company will be doing considerable construction on its present system to meet the increasing demand for gas. By the end of 1949 it is estimated that the company will have invested during the post-war period over $4,000,000, and probably half of that amount in 1946.

The number of consumers has increased from 10,673 at the end of 1934, to 18,500 at the present time. During the same interval the price of gas, unlike most commodities, has steadily decreased. In 1934 the company received an average rate of 33.9c; today it is 24.7c.

The company's gas reserves in the Viking and Kinsella fields are very large and certainly adequate for many years to come. Moreover, there are indications of the existence of other substantial gas reserves in northern Alberta.

Natural Gas & Petroleum Assn. of Canada

The Natural Gas and Petroleum Association of Canada, will hold its 20th Annual Convention on May 22nd-23rd, at the Prince Edward Hotel, Windsor, Ontario. This is the first convention of the Association since the war started.

That very pleasant feature of our former Conventions, the Annual Golf Tournament, will take place on the afternoon of Wednesday, May 22nd, and on the evening of that day the business session of the Convention will be held for the presentation of reports, appointment of committees and the transaction of such other business as may come before the Meeting.

The morning and afternoon sessions of Thursday, May 23rd, will be devoted to papers, discussion and a questionnaire on problems of interest to the natural gas industry.

Dresser Industries Annual Report to Shareholders

Fourteen companies, serving primarily the oil and gas industries, are now members of the Dresser group. Commenting upon Dresser's method of growth, H. N. Mallon, president of the company, states in the letter to shareholders accompanying the report:

"The purpose of adding new member companies to the Dresser group during the past year was to gain desirable and selective representation in certain phases of the oil and gas industries."

Commenting upon the long-term outlook for Dresser products, the report states:

"It appears to be indicated that after a temporary period of readjustment, the over-all volume of business related to the petroleum industry will be substantially larger, postwar, than was the case prewar.

"In the field of home comfort, automatic heating systems replacing old, inefficient heating methods represent possibilities even more extensive than those presented by new housing programs; particularly in view of the prospective extension of natural gas facilities.

"Every extension of the use of petroleum and gas means a potential expansion of the products of Dresser member companies."

Bryant Heater Appoints Habegger Adv. Mgr.

Lyle C. Harvey, president, Bryant Heater Company, Cleveland, Ohio, announces the appointment of O. Fred Habegger as manager of advertising.

O. Fred Habegger

A native of Pittsburgh, Habegger is a graduate of the University of Pittsburgh where he also pursued graduate studies in heating and air conditioning.

Before coming to Bryant, he was connected with the sales departments of Standard Register, Dayton, and the Equitable Gas Company of Pittsburgh.

Roper Corporation Announces New Appointments

Since the appointment of W. J. Foster as General Sales Director of Roper, S. W. Weill who served as Assistant Eastern Manager was named Foster's successor as Eastern Manager.

For several years before the war he was a Roper representative in the Eastern territory. During the forepart of the war he assumed the duties of Personnel Director at the Roper Plant in Rockford. In 1944 he was appointed Assistant Eastern Manager.

Charles C. Eaton has joined the Roper force, working with D. S. Sharpe in the Louisiana-Mississippi territory.

Coming from Lake Charles, La., where he was located as a salesman and dealer from 1939 through 1945, he has first hand acquaintance wtih his territory.

A. F. Harris, new Roper sales representative working with Dave Sharpe in Florida and Southern Georgia, is a native of Mobile, Alabama.

Prior to the war he was associated with the Gulf Power Company, Pensacola, Florida; Peoples Water and Gas, Meridian and Columbus; and the Birmingham Gas Company, Birmingham, Alabama.

Ben L. Landis, formerly with the War Manpower Commission, recently joined the Roper Staff. He will work with S. W. Weill, eastern manager, in the Pittsburgh area.

Following his discharge in World War I, Mr. Landis entered the appliance selling field. He was with the Harrisburg Gas Co. at one time. A large part of his experience has been in sales training.

Major with Bituminous Coal Research

Dr. Harold J. Rose, vice president and director of research of Bituminous Coal Research, Inc., has announced the appointment of William S. Major of Philadelphia, Pa., as development engineer for the national research agency of the bituminous coal industry. Well known in the power field after 20 years of service with American Engineering Company, manufacturers of industrial stokers, Major will be responsible for promoting various BCR research projects that have progressed far enough to justify commercial trial or use.

He has assumed his new duties, with headquarters in the Oliver Building, Pittsburgh, where he is associated with Dr. Rose; Elmer R. Kaiser, assistant director of research; and T. A. Day, special representative, present members of the BCR staff.

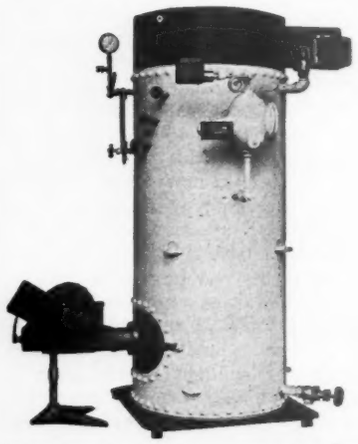
Ramsburg and Kirkpatrick Retire

Retirement of two executives of Koppers Company, Inc., is announced by J. P. Williams, Jr., president of the company. Those retiring are: C. J. R. Ramsburg, Vice-President, Research Division; and H. B. Kirkpatrick, manager of the Koppers Building.

Mr. Ramsburg joined the H. Koppers Company, a predecessor of the present company, in Chicago in 1913 as vice-president. Mr. Ramsburg's first business association was with the United Gas Improvement Company in Philadelphia.

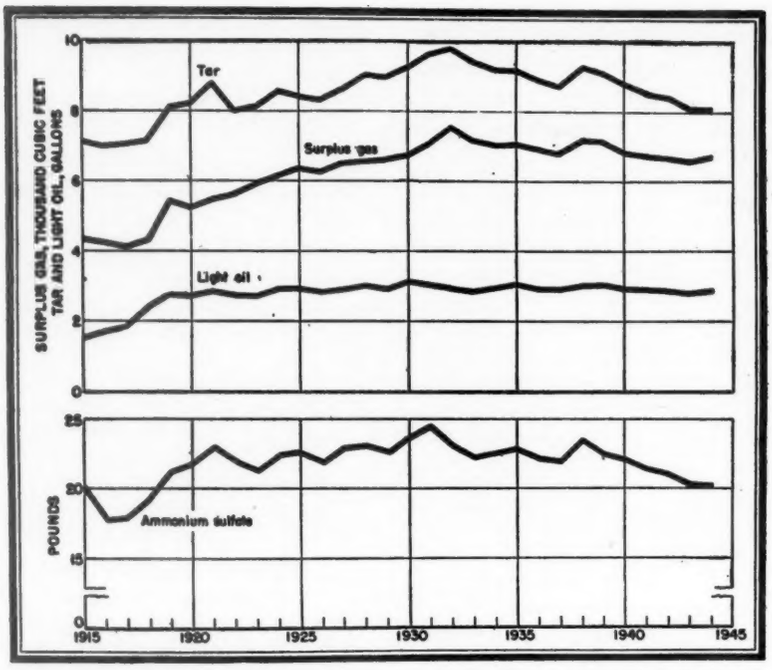
Mr. Kirkpatrick joined the H. Koppers Company in Chicago in 1912 as an estimator. He was engaged in sales work in connection with construction activities from 1913 to 1929 when he became manager of the Koppers Building, Pittsburgh.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa



Average yield of principal byproducts per net ton of coal carbonized in byproduct-coke ovens, 1915-44. Figures for light oil represent average at plants recovering light oil.

Thorp Honored by Secretary of Navy

Chester A. Thorp, Chief Engineer of Research of the American Gas Association Testing Laboratories, has been presented a Commendation Award by the Secretary of the Navy.

Lt. Commander Thorp's citation is for outstanding performance of duty in effectively handling liaison duties which contributed in a large measure to the successful production of the radio proximity fuze.

At the recent meeting of Committee D-3 on Gaseous Fuels of the American Society for Testing Materials Mr. Thorp was appointed by Chairman A. W. Gauger as a member of Subcommittees D-3-1 on Collection of Gaseous Fuel Samples and Subcommittee D-3-VII on Complete Analysis or Chemical Composition of Gaseous Fuels. He has also been appointed by the American Society of Heating and Ventilation Engineers to membership on its 1946 Technical Advisory Committee on Air Distribution and Air Friction.

Plastic Coating for Heavy Equipment

Corrosite, a new and practically impermeable air-drying film, completely resistant to most acids, all alkalies, and many chemicals, has recently been developed by Baker Synthetics, Inc., 51 East 42nd Street, New York. The new coating—a combined thermoplastic and thermosetting film—is unaffected by chemical fumes, salt air, salt water or underground acid conditions. In consequence, it will probably be applicable for gas holders, purification tanks, cooling towers, pipe lines, etc.

Advantages of Corrosite are, first, that it will bond to practically any clean surface, including old paint. Second, it offers great abrasion resistance. The hardest air-drying film available, it takes a sharp knife to scratch it. Third, it is electrolytically impervious: a three-coat application will eliminate deterioration caused by electrolytic corrosion.

No prime or intermediate coats are required, and, prior to application, no special or unusual surface preparation is needed. Corrosite clear weighs 9.0 pounds per gallon and covers up to 450 sq. ft. Successive coats can be applied with only one hour's drying time between them—permitting a three-coat application in a single day.

Corrosite will not crack, chip or lift, and will withstand temperatures up to 250° F. Applied exactly like paint, it will, coat for coat, long outlast any other air-drying film now in use. Currently available in black, clear ,aluminum and gray, it is shipped in five gallon cans and fifty-five gallon drums.

Corrosion - Resistant Fittings. Again obtainable from Schutte & Koerting Company, 12th & Thompson Streets, Philadelphia 22, Pa. are fittings, valves and jets made of Everdur, the American Brass Company's corrosion-resistant, manganese-silicon bronze. This special metal fills the needs of severe service conditions encountered in chemical processes by offering good resistance to such corroding agents as sulphuric acid, alkaline sulphates, hydrochloric acid or zinc chloride.

The fittings, which include elbows, tees, couplings, plugs, nipples and other standard types, are carried in stock in sizes from ¼ inch to 2 inches and are obtainable on order up to 4 inches. Valves including globe and angle stop, globe and angle check and self-aligning gate are in stock from ¼ inch to 2 inches and on order in 2½ inch or 3 inch sizes. A complete line of jet equipment including condensers, ejectors, exhausters and heaters is also available.

INDEX TO ADVERTISERS

American Meter Co.	4-5	Lambert Meter Co., Inc.	44
American Radiator & Standard Sanitary Corp.	—	Lattner Mfg. Co., P. M.	66
American Stove Co.	—	Lavino & Co., E. J.	44
Allied Control Valve Co.	61	Lincoln Electric Co.	—
Autogas Company	37	Metric Metal Works	4-5
Blaw-Knox Company	—	Norton Company	25
Bryant Heater Co.	—	Norwalk Valve Division	61
Buell Engineering Co.	—	Pacific Gas Corp.	—
Cast Iron Pipe Research Ass'n. The	6	Pittsburgh Equitable Meter Division, Rockwell Manufacturing Co.	—
Cleveland Gas Meter Co.	44	Republic Flow Meters	37
Cleveland Heater Co.	51	Reynolds Gas Regulator Co.	Front Cover
Cleveland Trencher Co.	28	Robertshaw Thermostat Co.	—
Coal Carbonizing Co.	64	Roper Corp., Geo. D.	—
Columbia Burner Co.	62	Ruud Manufacturing Co.	—
Columbia Gas & Electric Co.	7	Safety Gas Main Stopper Co.	47
Connolly Iron Sponge & Governor Co.	64	Semet-Solvay Engineering Corp.	3
Cooper-Bessemer Corporation	8	Sellers Engineering Corp.	—
Cribben & Sexton Co.	30	Servel, Inc.	—
Cruse-Kemper Co.	33	Skinner Co., M. B.	—
Detroit-Michigan Stove Co.	34	Smith Corporation, A. O.	10
Dresser Industries	—	Sprague Meter Co.	Back Cover
Dresser Mfg. Div., Dresser Industries	2	Stacey Bros., Div. Dresser Industries	46
Gas Machinery Co.	44	Stacey Manufacturing Co.	56
Gas Purifying Materials Co.	62	Superior Meter Co.	29
General Coal Co.	—	Syntron Co.	—
General Gas Light Co.	38	United Engineers & Constructors, Inc.	19-20
Harper-Wyman Co.	—	Vulcan Proofing Co.	26
Inland Manufacturing Co.	62		

ENGINEERS WANTED

Wanted—Gas Engineers with experience on design of Carburetted Water Gas Plants and Equipment. United Engineers & Constructors Inc., 1401 Arch Street, Philadelphia 5, Pa.

POSITION OPEN

Plant Superintendent for Carburetor Water Gas Plant producing 1,000 MCF per day, located in the East. Reply giving full details of education, experience and age. Address Box 149, c/o American Gas Journal, Inc., 53 Park Place, New York City 7, N. Y.

WANTED

DOMESTIC GAS METERS
IRON, Any Type
PAVILION NATURAL GAS CO.
Geneseo, N. Y.

Richmond with Allis-Chalmers

Harold P. Richmond, former general superintendent of operations for the Jersey Central Power & Light Co., Asbury Park, N. J., has joined the New York office of the Allis-Chalmers Mfg. Co., Milwaukee, Wis., as central station representative specializing in all steam and gas turbine matters.

SUPPLERS AT THE GUILD BREAKFAST IN GALVESTON

Standing: (left to right) H. E. Howerton, Romus T. Bergh, J. C. Mansfield, Carl Liden, L. W. Timberlake, F. K. Toney, A. S. Kincaid, W. W. Hall, Bert P. Fisher.

Seated: (left to right) Marc Gilbert, S. D. Day, Carl Sorby, D. S. Sharpe.

Navy Certificate to A.S.H.V.E.

The Navy's Certificate of Achievement has been awarded to the Research Laboratory of the American Society of Heating and Ventilating Engineers according to advice received by Alfred J. Offner, President of the Society, 51 Madison Avenue, New York. The award, made in lieu of the Navy "E," signalizes the "recognition of exceptional accomplishment in behalf of the United States Navy and of meritorious contribution to the national war effort."

Gild Holds Breakfast

The Gild of Ancient Supplers in the Southwest territory, held a breakfast meeting March 21st, at the Buccaneer Hotel, Galveston, Texas, on the opening day of the Southern Gas Association meeting.

There are 14 Gild members in that territory, nine of which attended the breakfast, and there were four Supplers from other territories, which made the number at the breakfast thirteen.

Natural Gas

(Continued from page 14)

Field of Texas, it allows the pipeline companies a return on their investment in production and gathering of from 2 to 3 cents, whereas the prevailing price in the field as a whole is from 4 to 6 cents. This, according to the independent producer points to only one thing, an ultimate reduction in the prices now paid to him and the royalty holder. This, they claim, would mean a depression in the industry of a first character, and could only result in the general adoption by the states affected of a severance tax to force prices upward.

Better Relations Would Help Industry

Another great problem facing the natural gas industry today is how to improve inter-industrial relations so that each would appreciate the problems of the others, and realize that only through harmony could the industry achieve its promised destiny.

With the solution of these and its other problems, the Natural Gas Industry will go forward to new heights of achievement and public usefulness.

Toledo Conference

(Continued from page 36)

is the most desirable for the tailor shop from the standpoint of economy, safety and cleanliness. Mr. Wilson gave some detailed results of surveys made by his company in this field and recommended that a commercial representative specialize in tailor shop boilers so that maximum results could be obtained through cooperation with manufacturers, the tailors and the gas utility.

Concluding the panel session with an excellent paper, J. A. Rockefeller, Public Service Electric & Gas Co., Newark, N. J., presented "Your Part in a National Promotional Campaign." In this he outlined one of the projects being undertaken this year by the Food Service Equipment Committee to have a unified national commercial campaign. By this means, an effective medium to protect the commercial gas load will be in the hands of all gas utilities to put forth a united front in the interests of commercial gas and commercial gas appliances.

A capacity audience greeted Everett J. Boothby, President, American Gas Association who honored the conference delegates by delivering the Friday luncheon address.

Water Heating

(Continued from page 43)

will be available for recovery operation of the heater.

The Recovery Capacity—in gallons of water raised a *given* number of degrees, F., *per minute* is directly proportional to the rate, in B.T.U.'s per minute, at which the gas fuel is delivered to, and consumed by the main burner. For *each* 10,000 B.T.U.'s, of rated gas input *per hour* the recovery capacity—in gallons of water per minute at various, *given,* temperature rises will be approximately:

0.14	Gallon of Water Raised				100° F.
0.18	"	"	"	"	80° F.
0.24	"	"	"	"	60° F.
0.28	"	"	"	"	50° F.
0.35	"	"	"	"	40° F.
0.47	"	"	"	"	30° F.

The above figures reflect a thermal efficiency of the heater of 70% necessary to obtain A.G.A. approval. To determine the recovery capacity—expressed in terms of gallons *per minute*—divide the rated, *hourly* gas input by 10,000 and multiply the resulting figure by the water gallonage factor appropriate to the number of degrees, F., which the water must be *raised* in temperature as shown in the above table.

To determine the volume of hot water which will be available, during a given peak hour of demand, for *both* general use at 130° or 140° F., and *also* for subsequent boosting to a higher temperature, first determine the number of minutes out of the hour which will be available for recovery operation of the heater by subtracting the aggregate total of minutes required for booster operation to supply 180° to 190° water from 60. Next, multiply the resulting figure by the water gallonage factor appropriate to the number of degrees, F., which the cold water supply will have to be raised in temperature to maintain the required water temperature in the hot water storage tank. The volume of 130° to 140° water which will be available for general purpose use during a given peak demand hour may then be determined by subtracting the estimated volume of boosted water, which will be used at high temperature, from the total volume of 130° to 140° water which the heater can recover, or heat during the hour.

Directions covering the installation and adjustment of this type of gas-fired water heater for two temperature water heating service will be found in a following chapter.

Safe Distribution

(Continued from page 53)

be held with both hands, grasping the handle in such a position as to bring it up against the fleshy part of the palm with the fingers curved around pointing upward. The point of the file is usually grasped by the thumb and the first two fingers of the other hand. When holding a file with one hand the forefinger is generally placed on the top of the file and as nearly as possible in the direction of its length.

Use enough pressure on the forward stroke to keep the file cutting, for sliding over materials tends to dull the teeth or too much pressure chips or clogs the teeth. Raise the file slightly on the return stroke except when filing very soft materials.

It should be brushed frequently to clear the teeth and a gentle tap after every few strokes will loosen most of the chips.

Store files separately, either standing or hanging. Laying on or against other tools or objects dulls the cutting edges and rough handling may chip the teeth. Files should be kept dry so that the edges of the teeth will not corrode. Oil or grease may be removed with chalk.

Soldering Coppers

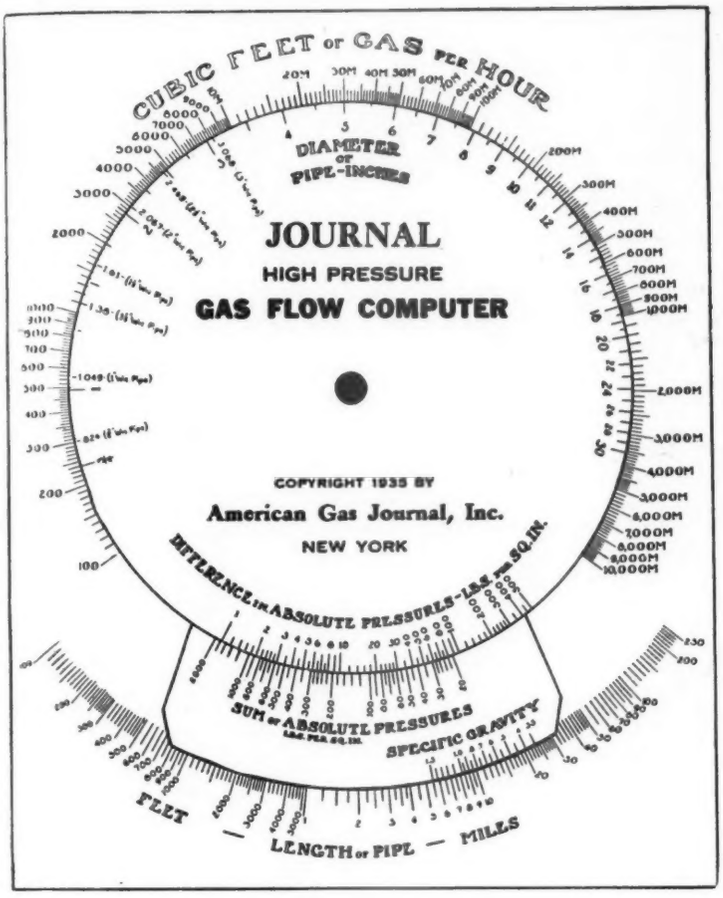
General—A soldering copper is a hand tool designed for use in joining or separating two pieces of metal using solder as a bond. Other uses include patching holes, filling up dents or heating a soldered connection for making a change.

A soldering copper should always have a well fitted wooden handle. Place the tang in the hole in the handle and tap the butt end of the handle on a hard object to drive the tang into place. A soldering copper should be shaped to fit the job at hand and these shapes may run from long, narrow, straight or curved points up to hatchet shaped or blunt end heads.

When tinning a copper on a sal ammoniac block breathing of the fumes should be avoided as they are acrid and unpleasant.

Extreme care must be used in handling a soldering copper because both the copper itself and the material to which the copper has been applied may result in serious burns from direct contact. The use of an oil base flux will reduce the spattering of hot solder. When running solder from a seam the workman should assume a position that will prevent contact with the hot solder.

"Journal" Gas Flow Computers



These Improved Gas Flow Computers are available in durable celluloid, encased in a convenient leatherette cover with complete instructions.

Actual Size 6¼ x 7½

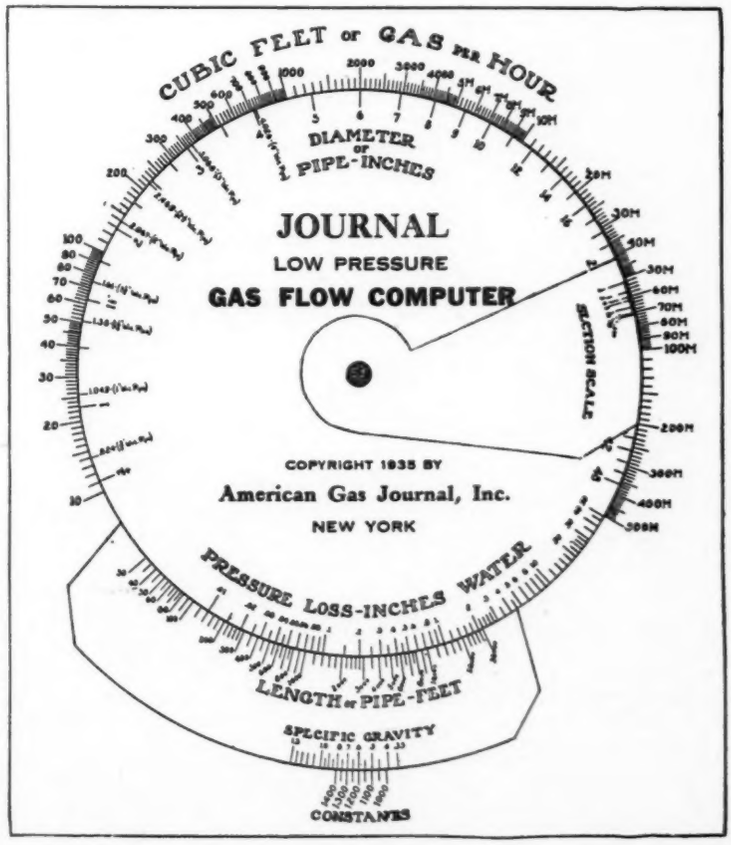
High Pressure Computer Range:

Cu. Ft. of Gas Per Hour—100-10,000 M
Diameter of Pipe Inches ¾-30
Difference in Absolute Pressure—Lbs. per sq. in. 1-500
Sum of Absolute Pressures—Lbs. per sq. in. 2000-20
Specific Gravity 1.5-.35
Length of Pipe—Feet 100-5000
Length of Pipe—Miles 1-250

Low Pressure Computer Range:

Cu. Ft. of Gas Per Hour—10 to 500 M
Pipe Diameter ¾" to 48" (including standard and actual weight up to 4")
Pressure Loss Inches .01-10.
Length of Pipe—Feet 30-30,000
Specific Gravity 1.5-.35
Constants 1400-1000

Price $3.50 Each, Postage Prepaid
After July 1st, price $4.00



AMERICAN GAS JOURNAL
53 Park Place, New York 7, N. Y.

Please enter our order for Computers as follows at $3.50 each, postage prepaid

....HIGH Pressure Computer

....LOW Pressure Computer

NAME .....

ADDRESS .....

Another Step Forward

in the Modernization of
SPRAGUE GAS METERS
Now appearing
in its Streamline Case

THE SPRAGUE METER CO. **BRIDGEPORT, CONN.**

DAVENPORT, IOWA • LOS ANGELES, CALIF. • HOUSTON, TEXAS • SAN FRANCISCO, CALIF.